



Archive:

{In Archive} Pretty Prairie Nitrate violations and the use of bottle water

Ken Deason to: Mary Mindrup

03/07/2008 10:04 AM

Sent by: Ken Deason

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Mary,

In anticipation of receiving additional inquiries regarding the use of bottled water as a long term compliance solution for nitrates in drinking water; I have prepared responses to questions that we used recently for Kris Lancaster in response to questions posed by Mr. Jerry Moran. Please see the attached bottled water policy and response to questions asked by Kris.

Thank you....

I reviewed EPA's policy on bottled water on March 6th with OGWDW. Their response indicated that bottled water is still prohibited as being anything more than a temporary option. OGWDW decided not to make any policy changes or follow up further after the listening session (*which was held for stakeholders last fall*) - mostly because anything OGWDW prescribed would likely be more stringent than what the interested states wanted. OGWDW felt states had enough flexibility under enforcement agreements to allow bottled water for the situations they desired. I believe the only way OGWDW would get involved at this point, would be on a formal request for guidance or on a referral of an enforcement case [from the Region's].



Bottled Water Issue Paper.doc

Kris,

Attached is our response to the question posed by the reporter. Please let me know if you need additional information or clarification.

Ken



Nitrate questions.doc

Kris,

As we have stated: The EPA, State and local communities work to achieve the goal of public health protection. Every person deserves water which meets the public health protection standards provided by the Safe Drinking Water Act.

EPA regional offices do not have the information regarding the specific studies used to determine long-term exposure. The CDC has the information regarding the spleen as identified in the attached document as of the summer 2003. Below are fact sheets or web location for further information.

EPA Consumer Factsheet on: NITRATES/NITRITES - For more information, visit

http://www.epa.gov/OGWDW/contaminants/dw_contamfs/nitrates.html



contaminants-CDC.pdf

From the desk of
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Kris Lancaster/R7/USEPA/US



Kris
Lancaster/R7/USEPA/US
02/14/2008 06:28 AM

To Ken Deason/R7/USEPA/US@EPA, Mary
Mindrup/R7/USEPA/US@EPA
cc

Subject Fw: Re: Ryan: Thanks for sending me a tearsheet

Hello Ken and Mary,
It looks like he has additional questions. What would be your response?
I will be in the office around 3 p.m. Thursday. I am at a biofuels meeting in Ames, Iowa.
Kris

-----Forwarded by Kris Lancaster/R7/USEPA/US on 02/14/2008 06:31AM -----

To: Kris Lancaster/R7/USEPA/US@EPA
From: "Ryan Bergen" <ryan.p.bergen@gmail.com>
Date: 02/13/2008 10:35PM
Subject: Re: Ryan: Thanks for sending me a tearsheet

Thank you for your help.

I've come upon another couple questions:

What studies did the EPA use to determine that long-term exposure to nitrates in drinking water puts people at risk of diuresis, starchy deposits in the spleen and hemorrhaging of the spleen?

When were these long-term effects added to the list of health hazards for levels of nitrates higher than the

MCL?

Thank you,

Ryan Bergen
The Ninnescah Valley News
620 459 6322

On Feb 12, 2008 10:11 AM, < Lancaster.Kris@epamail.epa.gov > wrote:

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U.S. Environmental Protection Agency
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Bottled Water to Achieve Compliance with SDWA

Under the Safe Drinking Water Act (SDWA) bottled water is allowed for use in very limited situations, such as in emergency situations¹ or as a temporary measure under variances and exemptions².

Small system challenges were a major focus of the 1996 SDWA Amendments. Through the '96 amendments, Congress sought to help systems meet these challenges by explicitly allowing systems to use point-of-use (POU) and point-of-entry (POE) treatment devices to achieve compliance with some MCLs [1412(b)(4)(E)(ii) of SDWA. Congress did not address the use of bottled water as a compliance option.

Statute

There is no statutory prohibition on the use of bottled water to achieve compliance.

Regulation

Variances and Exemptions

Public water systems that use bottled water for a variance or exemption are required to meet the following conditions of implementation:

- Establish a monitoring program, and annually monitor a representative sample of bottled water for MCLs of all regulated organic and inorganic contaminants.
- Provide the state with certification from the supplier in the first quarter and then annually, that the water meets applicable FDA regulations for approved source and monitoring requirements, and that it meets all MCLs.
- The system must provide sufficient quantities of bottled water to every person, delivered to the door.

Note: The use of bottled water for consumption does not negate the need for other centralized treatment, especially for acute contaminants and VOCs.

Compliance

Bottled Water is prohibited for use by a public water system to achieve compliance with an MCL [40 CFR 141.101]. "Public water systems shall not use bottled water to achieve compliance with an MCL. Bottled water may be used on a temporary basis to avoid unreasonable risk to health."

Rationale for prohibition of bottled water for compliance

The legislative history does not contain anything specific on bottled water, but it does refer to the general principle that SDWA cannot allow the burden of compliance to fall on

¹ The statute in Part D Emergency Powers, Section 1431 refers to 'alternative' water supplies in emergency situations, where alternative is interpreted as bottled or trucked water.

² There are very few exclusions:

Under the definition of a Public Water System (PWS) where constructed conveyances such as irrigation channels provide water that is actually used for human consumption, the system owner may be required to supply an alternative source of water for human consumption needs (bottled water or POU). See definition of a PWS under SDWA Sec. 1401 (4)

the customer. This forms part of the basis for the rationale that a system must ensure sufficient quantities and door-to-door delivery when it provides bottled water under variances and exemptions.

- When EPA promulgated the rule in 1987 prohibiting bottled water for compliance, the conditions for variances and exemptions, as outlined above, were considered the minimum necessary to assure adequate drinking water quality.
- Nov 2-4, 1999, At a National Drinking Water Advisory Council (NDWAC) meeting held in Baltimore, MD, NDWAC members expressed concern that quality assurance of bottled water - through testing and reporting - may not be adequate to protect public health. Major concerns included product labeling, shelf life, tracking of distribution of bottled waters, monitoring of compliance with public health standards, consumer right-to-know, intrastate bottlers and international bottlers.
- EPA also believes that access to delivery of sufficient quantities could be problematic. Therefore bottled water was not considered an acceptable permanent means of meeting MCL requirements.

Regulation of Bottled Water

The Food and Drug Administration (FDA) regulates bottled water. However, FDA regulations do not apply to water bottled and sold within a state. Some states set intrastate standards for bottled water. There are some differences in regulatory requirements for tap water (EPA regulations) and bottled water (FDA regulations) that include monitoring frequency, testing and reporting requirements, laboratory certification, source monitoring and provision of information to consumers.

Costs of Bottled Water

The 1996 Variance Technology Findings for Contaminants Regulated Before 1996, uses a consumption rate of 2 liters per person per day for bottled water to estimate DWEL and the affordability threshold. Assumptions on cost are based on 2 liter per person per day for consumption.

Since public water system (PWS) must home-deliver bottled water, this results in higher costs to the PWS than just the cost of purchasing and/or bottling the water. In addition to the purchase costs of bottled water, other actual costs include:

- logistics costs for regular delivery and return of bottles
- programmatic and monitoring requirements
- testing and certification requirements
- public education

Response to Questions on Safe Drinking Water Act Nitrate Standard –

The EPA, State and local communities work to achieve the goal of public health protection. Every person deserves water which meets the public health protection standards provided by the Safe Drinking Water Act.

1. Since the beginning of the Safe Drinking Water Act, has it always been 10 mg per liter?

In 1974, Congress passed the Safe Drinking Water Act (SDWA). This law requires EPA to determine levels of chemicals in drinking water which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals (MCLG).

The MCLG for nitrates has been set at 10 parts per million (ppm), and for nitrites at 1 ppm, because EPA believes this level of protection would not cause any of the potential health problems.

Based on this MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies.

The MCL for nitrates has been set at 10 ppm, and for nitrites at 1 ppm, because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonably be required to remove this contaminant should it occur in drinking water.

The level of nitrate or nitrite (measured as nitrogen) in water can be reported in two different units of measurement: milligrams of nitrate per liter of water (mg/L) or parts of nitrate per million parts of water (ppm).

2. Why is the use of bottled water unacceptable in complying to an MCL?

Under the Safe Drinking Water Act (SDWA) bottled water is allowed for use in very limited situations, such as in emergency situations or as a temporary measure under variances and exemptions.

However, bottled water is prohibited for use by a public water system to achieve compliance with the Maximum Contaminant Level (MCL); 40 CFR § 141.101 reads “Public water systems shall not use bottled water to achieve compliance with an MCL. Bottled water may be used on a temporary basis to avoid unreasonable risk to health.”

3. Are there other health concerns besides blue baby syndrome when nitrate levels exceed the MCL?

Short-term: Excessive levels of nitrate in drinking water have caused serious illness and sometimes death. The serious illness in infants is due to the conversion of nitrate to nitrite by the body, which can interfere with the oxygen-carrying capacity of the child’s blood. This can be an

acute condition in which health deteriorates rapidly over a period of days. Symptoms include shortness of breath and blueness of the skin.

Long-term: Nitrates and nitrites have the potential to cause the following effects from a lifetime exposure at levels above the MCL: diuresis, increased starchy deposits and hemorrhaging of the spleen.

Further, nitrite is of particular health concern in the body because it causes the hemoglobin in the blood to change to methemoglobin. Methemoglobin reduces the amount of oxygen that can be carried in the blood. This results in cells throughout the body being deprived of sufficient oxygen to function properly. This condition is called methemoglobinemia.

Pregnant Women and Methemoglobinemia - During pregnancy, it is common for methemoglobin levels of the pregnant woman to increase from normal (where 0.5 to 2.5% of the total hemoglobin is in the form of methemoglobin) to a maximum of 10% in the 30th week of pregnancy. The level of methemoglobin declines to a normal level after delivery. Therefore, pregnant women are particularly susceptible to methemoglobinemia and should be sure that the nitrate and nitrite in their water is at safe levels.

Infants and Methemoglobinemia - Infants, particularly those under six months of age are the most at risk of developing serious health problems from drinking water that contains elevated levels of nitrate or nitrite. This is because there are differences between the bodies and behaviors of infants and adults or older children. Infants below the age of six months who drink water containing nitrate in excess of the maximum contaminate level could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.

4. Has the EPA found any negative health effects to long-term exposure to nitrate levels that exceed the MCL in public water systems?

Long-term: Nitrates and nitrites have the potential to cause the following effects from a lifetime exposure at levels above the MCL: diuresis, increased starchy deposits and hemorrhaging of the spleen.

References –

EPA Consumer Factsheet on: NITRATES/NITRITES - For more information, visit http://www.epa.gov/OGWDW/contaminants/dw_contamfs/nitrates.html

CDC Healthy Water Fact Sheet – Summer 2003 - For more information, visit www.cdc.gov/ncidod/healthywater

I. INTRODUCTION

Concentrations of nitrate which exceed the Maximum Contaminant Level (MCL) occur frequently among Public Water Supply (PWS) systems in Kansas. On March 25, 1997, the Kansas Department of Health and Environment (KDHE) entered into an agreement with Region 7 of the Environmental Protection Agency (EPA) to establish a response procedure for KDHE to address systems which have a recurring history of nitrate violations. The MCL for nitrate is 10 mg/l when measured as nitrogen. The Strategy was designed to apply to systems which exceed the nitrate MCL in two or more consecutive quarters, and requires escalation when nitrate levels exceed 15 mg/l and 20 mg/l. The Strategy was to be implemented with an administrative consent order or an administrative order, where the order would expire seven years from the date in which it was issued. At that point, KDHE and EPA would review the Strategy to determine whether extensions should be granted.

During the Annual Program Evaluation for 2003, conducted in April 2004, EPA reviewed several systems under the Nitrate Strategy and recommended that the Strategy be evaluated. On April 20-21, 2005 EPA conducted a file review which was initiated by the Water Enforcement Branch. Kim Harbour, Water Enforcement, Michael Massey, Regional Counsel and Ralph Flournoy, Drinking Water Management Branch and Kansas Coordinator, conducted the review. Twenty-six systems that exceeded the nitrate MCL of 10 mg/l were examined. Sixteen of the files were for community systems in which the Nitrate Strategy had been applied. Two of the files were for community systems that qualified for the Nitrate Strategy, though KDHE chose to seek alternatives to address the systems. Three of the files were for community systems not yet meeting the criteria for inclusion under the Nitrate Strategy. Four of the files were for non-community systems in which KDHE had extended the MCL to 20 mg/l, as permitted under 40CFR 141.11(d).

The results of the file review regarding the Nitrate Strategy are included in this report. Since the majority of systems listed on Unaddressed SNC Report are for nitrate MCL exceedances, this report replaces the Annual Program Evaluation of activity occurring in 2004.

II. EVALUATION OF COMPLIANCE WITH THE STRATEGY

NON-COMMUNITY SYSTEMS

The "APPLICABILITY" section of the Strategy states "The Bureau of Water will apply this strategy to community public water supplies. Non-community supplies (both transient and non-transient) are allowed nitrate levels up to 20 mg/l as nitrogen, subject to certain posting and public education requirements."

Under 40 CFR 141.11, nitrate levels not to exceed 20 mg/l are permissible when four criteria are met:

- 1) The supplier has demonstrated to the State that water will not be available to children under 6 months of age
- 2) Public Notice is continually posted
- 3) Local and State health authorities are notified annually of nitrate levels that exceed 10 mg/l
- 4) No adverse health effects result

EPA reviewed five non-community systems in which nitrate levels exceeded 10 mg/L. The systems reviewed were: KDOT Colby Rest Stop East Bound (KS2119308), Fairfield High School (KS2115514), Maize Intermediate School (KS2117304), Colwich Elementary School (KS2115513), and Tyson Fresh Meats, Inc. (KS2105525). The files contained evidence to support that public notice was continually posted and no known adverse health effects had resulted. However, the files lacked documentation to support that the supplier had demonstrated to the State that the water being served was not available to children under 6 months of age, particularly among systems where infants could potentially drink the water, such as KDOT Colby Rest Stop and Colwich Elementary School. Both Colwich Elementary and Maize Intermediate are no longer operating as individual systems, and have since connected to municipal systems. Tyson Fresh Meats exceeded 20 mg/l in January-March 2002, July-September 2002, October-December 2003 and January-March 2004. KDHE administered an order to seek corrective action in March 2004. Meanwhile, bottled water is being provided.

MINIMAL REQUIREMENTS FOR COMMUNITY SYSTEMS

The "STRATEGY" section of the Nitrate Strategy requires all community systems that exceed nitrate levels of 10 mg/l to give public notice. The Strategy further states, "The public notice will include a recommendation to seek an alternative source of water for infants under six months of age, mothers nursing infants under six months of age, and pregnant women. The public water supplier will also be required to continue quarterly monitoring as required by regulation."

Several community systems, which exceeded nitrate levels but were not required to meet further conditions outlined in the Strategy were evaluated. These files were selected to verify that KDHE was applying the Strategy when applicable, and to ensure that Nitrate MCL violations not meeting the criteria for the Nitrate Strategy were treated in accordance with federal regulations.

The systems selected were: City of Grainfield (KS2006302), City of Lucas (KS2016702), and City of Solomon (KS2004105). Information in the files supports that all three systems incurred non-consecutive nitrate violations, and therefore, are not subject to the Nitrate Strategy. The systems are still subject to the Public Notification requirements. Public Notice was posted for all three systems and bottled water was made available for infants and pregnant women. Public notice was not posted within 24 hours. Regulations published on May 4, 2000 require that public notice be provided to all systems that exceed the level for nitrate within 24 hours. This requirement is set forth under 40 CFR 141.202.

Documentation in the files supports that KDHE treats nitrate violations not qualifying under the Strategy with validity. The system history documented for Grainfield indicates that while only two nitrate exceedances have occurred, KDHE is in correspondence with the City to seek an alternative supply. The Nitrate exceedance for the City of Solomon occurred from improper sampling, and was not reflective of the quality of water supplied to the public. The City of Lucas currently has treatment installed which should reduce nitrate concentrations.

SYSTEMS IN VIOLATION FOR 2 CONSECUTIVE QUARTERS

Systems in violation for nitrate within two or more consecutive quarters must meet additional requirements, as outlined by the Strategy. Additional requirements fall into four categories: 1) Monitoring, 2) Public Notification 3) Providing an Alternative Source of Water

and 4) Corrective Actions. A summary of violations for systems evaluated, including systems that qualified for the Nitrate Strategy, are listed in Appendix A.

1. MONITORING—The Strategy allows for KDHE to increase the frequency of monitoring to monthly when necessary to establish the trend of nitrate concentrations.

Of the systems reviewed, none were on monthly monitoring. The nitrate levels were stable for most systems but varied enough for a few systems like Irwin and Gaylord that monthly sampling was justified.

2. PUBLIC NOTIFICATION—As noted earlier in this report, 40 CFR 141.202 mandates that public notice be provided to all systems which exceed the nitrate level within 24 hours, as published on May 4, 2000.

Of the eighteen systems reviewed in which the Strategy was applied, none were found to be in compliance with the 24-hour Public Notification requirement. Specific examples of the timeframes in which KDHE has implemented the Public Notification requirements are included in the individual system histories, located in Appendix B.

The Strategy dictates that the public notice “will be provided to all local health care providers, including medical doctors, clinics, hospitals, and the appropriate local county health department,” as well as “day care providers and commercial establishments serving the traveling public, such as restaurants and roadside parks.” Four of the eighteen systems—Jewell, Long Island, Norwich and Plains—provided information to KDHE which indicates the notice had been distributed to facilities meeting this description. Conversations with KDHE staff revealed that the notice is often distributed to the county health department per the initiative of KDHE, which partially fulfills the Strategy requirements. Receipt of the public notification among day cares and traveling public establishments is uncertain since the files do not contain this documentation.

The public notice must also describe the alternative water program. The public notice typically claimed that bottled water was being provided. Contact information was sometimes provided to inquire about the alternative water program, but few notices contained language describing specifics of where and how to obtain the bottled water.

3. ALTERNATIVE SOURCE OF WATER—The Strategy necessitates that the public water supplier shall provide an alternative source of drinking water to all infants under six months of age, and mothers nursing infants under six years of age free of charge.

The public notice indicates that this is being conducted, typically through provision of bottled water. According to the Strategy, the supplier is required to submit a proposal indicating how the water will be supplied. Files did not contain information regarding these proposals.

4. CORRECTIVE ACTIONS—The extent of corrective actions mandated under the Strategy depends on the concentration of nitrate reported for the system. Findings of the corrective actions portion are organized in this report accordingly.

SPECIAL REQUIREMENTS FOR SYSTEMS BETWEEN 10-15 mg/l

When nitrate is detected at levels ranging from 10-15 mg/l in any two consecutive quarters, the supplier is required to evaluate the feasibility of seven options which may remedy the nitrate exceedances. These seven solutions include: i) Obtaining a new source of water ii) Blending iii) Purchasing from a provider that meets federal and state regulations iv) Connecting with a nearby provider that meets federal and state regulations v) Removing the source contributing to high nitrate levels from service vi) Participation in wellhead protection vii) Reviewing funding through the Community Development Block Grant program or Rural Economic Development agency.

Twenty systems were identified as incurring violations that ranged from 10-15 mg/l, and thus needed to fulfill the aforementioned requirements. EPA evaluated sixteen of these systems. Of the sixteen systems reviewed, steps taken to fulfill the requirements outlined in this section of the Strategy were only documented in seven of the systems. Of those seven systems, three fulfilled the requirements in a timely manner. Systems in which documentation exists to support that options were discussed include Arlington, Gaylord, Jefferson Co RWD #15, Jewell Co RWD, Long Island, Plains and Pretty Prairie. Of these systems, the cities of Arlington, Long Island and Plains have fulfilled their responsibilities outlined in the Strategy. The cities of Gaylord, Jefferson, Jewell and Pretty Prairie evaluated several of the options required under the Strategy, but timeliness could have been improved.

The City of Arlington has selected treatment in the case that nitrate levels increase. Two visits from the Kansas Rural Water Association (KRWA) are documented in the file, proposing a new well in Feb. 2003, immediately after the system exceeded nitrate levels in two consecutive quarters. Funding was secured in Sept. 2003. A follow-up visit was made by KRWA, indicating that the City had requested a preliminary engineering report.

The City of Plains evaluated the option of blending water within a year, as documentation in the file.

The City of Long Island evaluated construction of a new well and secured funding two and a half years after the Order was issued. It was not necessary for these systems to evaluate the feasibility of other options since a solution was found.

The City of Gaylord eventually was returned to compliance for remedying their high levels of nitrate. The City was placed under the Nitrate Strategy in 1997, and began blending in 2003. However, the file lacks information to support the steps taken for the City to reach that point.

Jefferson Co RWD #15 examined the possibility of connecting with a new supplier, obtaining a new water source and securing funds. However, the Order was administered in 1997, and options were not evaluated until 2002. KDHE sent a Penalty Order to prompt further action from the supplier, requiring a feasibility study.

Jewell Co RWD sought evaluation of these steps once they had surpassed nitrate levels of 15 mg/l. The supplier includes a publication entitled "Water Works" with their CCR every year. These publications communicate the progress of their search for a new water source, potential of connecting with a new supplier, wellhead protection and status of funding through the Community Block Development Grant. In the instance of Jewell Co RWD, this section of the strategy was met, though not in a timely manner. While the system was placed under the Order in 1997, activity was not initiated until 2001. Action was triggered by a response to nitrate levels that surpassed 15 mg/l. According to the Strategy, these options are to be explored once a system has passed 10 mg/l. Jewell Co RWD was in exceedance for nitrate prior to 1995, when violations were first reported to SDWIS.

The City of Pretty Prairie was quick to evaluate the option of wellhead protection. However, following other options were not documented as having been evaluated in the file. Selecting this option did not resolve the issue long-term, as the system is still in violation for nitrate.

SPECIAL REQUIREMENTS FOR SYSTEMS BETWEEN 15-20 mg/l

When nitrate levels exceed 15 mg/l in two consecutive quarters, the Nitrate Strategy calls for preparation of a formal feasibility study, prepared by a professional engineer. Of the twenty systems in which the Nitrate Strategy was applied, five systems reported levels above 15 mg/l, all of which were evaluated by EPA: Gaylord, Jewell Co RWD, Long Island and Norwich. Jefferson Co RWD #15 also surpassed 15 mg/l, but never for two consecutive quarters. Though not documented, feasibility studies were most probably conducted for Gaylord and Long Island. Since timing of the feasibility study is not documented, it is difficult to determine whether the report was conducted in a timely manner. Files indicate Norwich has not yet conducted a feasibility study.

The City of Gaylord surpassed nitrate levels above 15 mg/l in two consecutive quarters through samples taken in quarters that began in January 1998 and April 1998. The City began blending in 2004, indicating that a preliminary engineering report was most likely drafted, but was not made available in the file.

Jewell Co RWD #1 surpassed nitrate levels above 15 mg/l in two consecutive quarters, incurring violations in October 1999 and January 2000. A feasibility study was conducted in 2002, which includes a proposed treatment to reduce nitrates, and cost estimates, as required by the Strategy. While the conditions of the Strategy were satisfied, timeliness could have been improved.

The City of Long Island had surpassed nitrate levels greater than 15 mg/l in two consecutive quarters prior to being placed under the Strategy in 1997. KDHE sent a reminder to the supplier in December 1999, requesting that a feasibility study be submitted. While new wells were installed in 2002, the feasibility study was not located in the file.

The City of Norwich had not prepared a feasibility study because the system did not meet the 15 mg/l until recently. Nitrate levels initially surpassed 15 mg/l in January 1998, but it wasn't until October 2004 and January 2005 that nitrate was detected above these levels in two consecutive quarters.

SPECIAL REQUIREMENTS FOR SYSTEMS ABOVE 20 mg/l

When nitrate levels exceed 20 mg/l in two consecutive quarters, the Nitrate Strategy dictates the supplier to implement the most feasible option previously identified when nitrate ranged from 10-15 mg/l. Of the twenty systems in which the Strategy was applied, the City of Long Island is the only one that exceeded 20 mg/l for nitrates in two or more consecutive quarters.

The City of Long Island surpassed 20 mg/l in the quarters beginning with April 2000 and July 2000. KDHE sent a letter to the supplier dated July 27, 2000 requiring quarterly monitoring. The supplier was not notified in the letter that treatment was required. On June 14, 2001, KDHE sent a letter to the system stating that proof of public notice had not been received for the past four violations. Funding for the new wells was secured in Spring 2001 and construction began in August 2002. In this instance, Strategy requirements for obtaining a new source were fulfilled. Public notice requirements were deficient.

IMPLEMENTATION

According to the Strategy, all agreements were to be implemented with an administrative consent order or administrative order. All systems under the Nitrate Strategy received orders, which clearly laid out the terms of the Strategy. The Strategy states that "Appropriate time frames for completion of the activities will be negotiated with the public water supplier." Documentation to support negotiation of time frames does not exist in the files. The Strategy also provides a provision to terminate the order for systems that meet the MCL for nitrate for four consecutive quarters. None of the systems under the Strategy have met these criteria. The Strategy further states that after seven years, KDHE and EPA will reevaluate the application of the Strategy among systems that have not returned to compliance. Criteria used for reevaluation include: whether the trend of nitrates is increasing or decreasing, amount of usage from points of entry, extent of participation in the wellhead protection program and availability of funding. In general, nitrate levels have increased or fluctuated. A steady decline of nitrates was not exhibited by any of the systems. Participation in a wellhead protection program was mentioned in two files: Jewell Co RWD and Pretty Prairie. There is not sufficient information in the files documenting involvement in wellhead protection, amount of usage in comparison to nitrate concentrations and funding. More specific evaluation of these criteria is included in Appendix B.

III. CONCLUSION

The Nitrate Strategy was originally intended to guide systems into compliance by encouraging the system to evaluate all options and determine the most effective means to reach compliance. System were allowed considerable time to attempt wellhead protection and secure funding. While several systems, such as City of Plains, City of Gaylord, City of Long Island and City of Green have reached compliance while under the Strategy, many systems, including City of Conway Springs, City of Norwich, City of Pretty Prairie, and Jewell County RWD #1 remain out of compliance after seven years. In instances where compliance has been achieved, more detailed documentation is necessary to support the time necessary to reach compliance.

Under 40 CFR 141.62, nitrate is permitted in systems at or below a level of 10 mg/l. According to the Strategy, corrective action is not required until nitrate levels reach 20 mg/l. EPA cannot enter into an agreement with the state which permits nitrate to be exceeded above the MCL. Timeliness is not stressed, nor encouraged in the Strategy. Since the Strategy does not provide deadlines for compliance, few systems assess feasible options in a timely manner.

IV. RECOMMENDATIONS

EPA can no longer enter into an agreement that is inconsistent with federal regulations. Sending administrative compliance orders or consent decrees with compliance schedules is a more effective way to guide systems into compliance. Systems currently under the Nitrate Strategy should be addressed using alternative methods. KDHE should continue to pursue enforcement against systems which continually detect nitrate at levels that exceed the MCL. Communication regarding the seriousness of nitrate violations can be improved by correcting deficiencies in the public notice and Consumer Confidence Report.

Recognizing that voiding the Nitrate Strategy may pose a significant workload burden on the state, EPA would like to provide KDHE with the time necessary to address the systems currently under the Nitrate Strategy. In order to afford KDHE this time, EPA requests a plan and schedule describing how KDHE will address the systems, along with copies of orders or consent decrees administered to the system.

**KDHE Nitrate Strategy Review
File Review
20-21 April 2005**

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2019116	Argonia	524	11.00, Jan.-March 2005 11.00, Oct.-Dec. 2004 11.00, April-June 2004 12.00, Jan.-March 2004 Monit., Oct.-Dec. 2003 11.00, July-Sept. 2003 11.00, April-June 2003 10.90, Jan.-March 2003	Currently under Nitrate Strategy
KS2015511	Arlington	452	11.00, Jan.-March 2005 13.0, April-June 2004 13.6, Jan.-March 2004 11.00, Oct.-Dec. 2003 14.00, July-Sept. 2003 10.91, April-June 2003 11.48, Jan.-March 2003 12.14, July-Sept. 2002	Currently under Nitrate Strategy
KS2019118	Conway Springs	1308	11.0, Oct.-Dec. 2004 10.7, July-Sept. 2004 11.0, April-June 2004 11.0, Jan.-March 2004 10.75, Oct.-Dec. 2003 11.04, July-Sept. 2003 10.70, April-June 2003 10.59, Jan.-March 2003 10.61, Oct.-Dec. 2002 10.74, July-Sept. 2002 10.93, Oct.-Dec. 2001 10.93, Oct.-Dec. 2000 11.43, July-Sept. 2000 10.72, April-June 1998 10.54, July-Sept. 1996 11.16, Jan.-March 1995	Currently under Nitrate Strategy

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2020106	Greenleaf	349	11.0, April-June 2004 10.6, Jan.-March 2004 12.00, July-Sept. 2003 12.00, Jan.-March 2003 11.00, Oct-Dec. 2002 11.00, July-Sept. 2002 11.57, Oct.-Dec. 2001 10.95, July-Sept. 2001 11.08, April-June 2001	Currently under Nitrate Strategy
KS2007708	Harper Co. RWD #4	320	11.00, Jan.-March 2005 11.00, Oct.-Dec. 2004 11.00, April-June 2004 12.00, Jan.-March 2004 11.00, July-Sept. 2003 11.00, April-June 2003 10.90, Jan.-March 2003	Currently under Nitrate Strategy
KS2006902 FILE NOT REVIEWED BY EPA	Ingalls	331	11.00, April-June 2004 12.00, Jan.-March 2004 12.00, Oct.-Dec. 2003 11.00, July-Sept. 2003 11.00, April-June 2003 12.67, July-Sept. 2000 11.17, April-June 2000 11.83, Jan.-March 2000 11.70, Oct.-Dec. 1999	Currently under Nitrate Strategy
KS2009505	Norwich	543	15.00, Oct-Dec. 2004 14.00, Jan.-March 2004 14.00, Oct.-Dec. 2003 Monit, Jan.-Dec. 2000 Monit., Jan.-Dec. 1999 13.10, Oct.-Dec. 1998 12.03, July-Sept. 1998 15.55, Jan.-March 1998 12.43, Oct.-Dec. 1997 12.14, April-June 1997 11.91, Oct.-Dec. 1996	Currently under Nitrate Strategy

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2008907	Jewell Co RWD #1	959	14.00, July-Sept. 2004 11.00, April-June 2004 12.00, Jan.-March 2004 13.00, Oct-Dec. 2003 13.00, July-Sept. 2003 15.00, April-June 2003 12.00, Jan.-March 2003 14.25, Oct-Dec. 2002 13.73, July-Sept. 2002 13.18, April-June 2002 15.25, Jan.-March 2002 14.59, Oct-Dec. 2001 12.32, July-Sept. 2001 15.25, April-June 2001 12.44, Jan.-March 2001 15.27, Oct-Dec. 2000 12.93, July-Sept. 2000 14.48, April-June 2000 15.81, Jan.-March 2000 15.25, Oct-Dec. 1999 12.40, July-Sept. 1999 12.70, April-June 1999 14.23, Jan.-March 1999 14.39, July-Sept. 1998 13.49, April-June 1998 13.62, Jan.-March 1998 13.60, Oct-Dec. 1997 13.05, July-Sept. 1997 10.92, April-June 1997 13.30, Jan.-March 1997 12.94, Oct-Dec. 1996 13.85, July-Sept. 1996 13.19, April-June 1996 12.44, Jan.-March 1996 13.47, Oct-Dec. 1995	Currently under Nitrate Strategy
KS2011903	Plains	1171	11.00, April-June 2004 11.00, Jan.-March 2004 11.00, Oct.-Dec. 2003 12.00, July-Sept. 2003	Currently under Nitrate Strategy

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2015501	Pretty Prairie	610	11.00, Oct-Dec. 2004 12.00, July-Sept. 2004 12.20, April-June 2004 11.50, Oct-Dec. 2003 10.90, July-Sept. 2003 11.10, April-June 2003 11.70, April-June 2002 12.20, Jan.-March 2002 10.60, July-Sept. 2001 11.50, Jan.-March 2001 10.90, April-June 1999 10.60, Jan.-March 1999 10.74, Jan.-March 1997 10.52, April-June 1996 13.65, Jan.-March 1995	Currently Under Nitrate Strategy
KS2019101	Sumner Co RWD #5	850	11.00, Jan.-March 2004 10.75, Oct.-Dec. 2003 11.04, July-Sept. 2003 10.70, April-June 2003 10.59, Jan.-March 2003 10.61, Oct.-Dec. 2002 10.74, July-Sept. 2002 10.93, Oct.-Dec. 2001 10.93, Oct.-Dec. 2000 11.43, July-Sept. 2000 10.72, Jan.-March 1998 10.54, July-Sept. 1996 11.16, Jan.-March 1995	Currently under Nitrate Strategy
KS2017313	Viola	215	11.00, Jan.-March 2004 10.75, Oct.-Dec. 2003 11.04, July-Sept. 2003 10.70, April-June 2003 10.59, Jan.-March 2003 10.61, Oct.-Dec. 2002 10.74, July-Sept. 2002 10.93, Oct.-Dec. 2001 10.93, Oct.-Dec. 2000 11.43, July-Sept. 2000 10.72, Jan.-March 1998 10.54, July-Sept. 1996 11.16, Jan.-March 1995	Currently under Nitrate Strategy

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2012703 FILE NOT REVIEWED BY EPA	White City	514	11.00, July-Sept. 2003 11.00, Jan.-March 2003 11.26, July-Sept. 2002 10.77, April-June 2002 11.56, Jan.-March 1998 10.67, July-Sept. 1996	Currently under Nitrate Strategy
KS2018301	Gaylord, City of	138	12.00, Jan.-March 2004 Monit., Oct.-Dec. 2003 Monit., July-Sept. 2003 13.50, April-June 2003 12.38, July-Sept. 2001 13.10, April-June 2001 13.15, July-Sept. 1998 24.94, April-June 1998 27.48, Jan.-March 1998 10.86, Oct.-Dec. 1997 15.18, July-Sept. 1997 11.87, April-June 1997 13.32, Jan.-March 1997	Previously under Nitrate Strategy Finalized blending of new wells in April 2004
KS2001305	Hiawatha, City of	3366	12.00, April-June 2003 10.64, Jan.-March 2003 12.22, July-Sept. 2002 11.08, April-June 2002 12.12, Jan.-March 2002 11.54, April-June 2001 13.17, Oct.-Dec. 2000 11.28, April-June 2000 11.30, July-Sept. 2000 10.87, Jan.-March 2000 10.68, Oct.-Dec. 1999 10.88, July-Sept. 1999 10.88, April-June 1999 11.01, Jan.-March 1999 11.39, July-Sept. 1998 12.19, April-June 1998 10.95, Oct.-Dec. 1997 10.71, July-Sept. 1997 10.67, Jan.-March 1997	Previously under Nitrate Strategy Installed new well to come into compliance in order to not be eligible for the Surface Water Treatment Rule in 2004

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2008721	Jefferson Co RWD #15	228	13.0, Oct.-Dec. 2004 13.0, July-Sept. 2004 13.0, April-June 2004 14.1, Jan.-March 2004 15, Oct.-Dec. 2003 14, July-Sept. 2003 14, April-June 2003 15.38, Jan.-March 2003 13.76, Oct.-Dec. 2002 14.13, July-Sept. 2002 13.83, April-June 2002 Monit Jan.-March 2002 12.66, Oct.-Dec. 2001 12.54, July-Sept. 2001 13.41, April-June 2001 11.82, Jan.-March 2001 13.88, Oct.-Dec. 2000 12.32, July-Sept. 2000 12.76, April-June 2000 12.20, Jan.-March 2000 12.24, Oct.-Dec. 1999 12.69, July-Sept. 1999 13.38, April-June 1999 11.05, Jan.-March 1999 10.77, April-June 1996	Previously under Administrative Order Previously under Nitrate Strategy, KDHE escalated due to non-compliance

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2013701	Almena	461	11.00, April-June 2003 12.23, April-June 2002 12.04, April-June 2001 13.75, Jan.-March 2001 11.44, Oct.-Dec. 2000 10.68, Oct.-Dec. 1999 11.70, July-Sept. 1998 .0575 April-June 1998 .0519 Jan.-March 1998 .0667, Jan.-Dec. 1997 10.73, July-Sept. 1997 11.38, Jan.-March 1995	Previously under Nitrate Strategy Returned to compliance in 2004
KS2008906 FILE NOT REVIEWED BY EPA	Burr Oak	241	Monit. April-June 2002 14.30, Jan.-March 2002 12.97, Oct-Dec. 2001 14.09, Jan.-March 2001 10.90, Oct-Dec. 2000 14.58, April-June 2000 .0981, July-Sept. 1998 .0724, April-June 1998 .0611, Oct.-Dec. 1996 .0785, Jan.-March 1995	Previously under Nitrate Strategy Connected with Jewell Co RWD #1, returned to compliance in 2004
KS2002703 FILE NOT REVIEWED BY EPA	Green	145	12.00, July-Sept. 2003 13.92, Oct.-Dec. 2003 13.30, July-Sept. 2002 13.21, Jan.-March 2002 13.30, July-Sept. 2002 11.88, July-Sept. 2001 11.67, April-June 2001 12.24, Jan.-March 2001 12.26, July-Sept. 2000 12.03, Jan.-March 2000 10.57, Oct-Dec. 1999 12.58, July-Sept. 1999 13.59, April-June 1999 13.10, Jan.-March 1999 11.79, Oct.-Dec. 1998 12.81, July-Sept. 1998 13.29, Jan.-March 1998 12.40, Oct-Dec. 1997 12.67, July-Sept. 1997 11.86, Oct-Dec. 1996 11.67, April-June 1996 10.94, Jan.-March 1996	Previously under Nitrate Strategy Returned to compliance in 2004

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
	Green, Continued		12.30, Oct-Dec. 1995 13.54, April-June 1995 10.65, Jan.-March 1995	
KS2014702	Kirwin, City of	226	11.00, April-June 2004 12.22, Jan.-March 2003 12.06, Oct-Dec. 2002 13.90, July-Sept. 2002 14.13, April-June 2002 16.21, Jan.-March 2002 19.67, Oct-Dec. 2001 19.29, April-June 2001 27.86, April-June 1998 22.94, Jan.-March 1998 15.46, Oct-Dec. 1997 11.34, July-Sept. 1997 12.39, April-June 1997 14.07, July-Sept. 1996 21.47, April-June 1996 12.46, Jan.-March 1996 16.93, Oct-Dec. 1995 16.97, April-June 1995 12.02, Jan.-March 1995	Previously under Administrative Order Installed new wells
KS2001301	Robinson	208	11.0, July-Sept. 2003 11.18, April-June 2001 12.34, July-Sept. 2000 11.18, Jan-March 2000 11.15, Oct.-Dec. 1999 12.06, April-June 1999 11.01, April-June 1995 11.0, Jan.-March 1995	Currently under Administrative Order
KS2006302	Grainfield, City of	321	14.0, Oct.-Dec. 2004 12.0, Jan.-March 2003 11.8, Jan.-March 2002 10.6, Jan.-March 1995	Nitrate Violations have not constituted an action

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2016702	Lucas	422	13.00, 2004 19.04, July-Sept. 1998 19.69, April-June 1998 19.54, Jan.-March 1998 19.63, Oct.-Dec. 1997 18.96, July-Sept. 1997 19.14, April-June 1997 20.26, Jan.-March 1997 20.28, Oct.-Dec. 1996 20.67, July-Sept. 1996 20.27, April-June 1996 19.33, Jan.-March 1996 17.08, Oct.-Dec. 1995 18.59, July-Sept. 1995 18.49, April-June 1995 19.76, Jan.-March 1995 23.22, Oct.-Dec. 1994	Previously referred to the Attorney General's Office. Ion exchange treatment was installed in 1998.
KS2004105	Solomon	1063	14.00, 2004	Nitrate Violations have not constituted an action
KS2115514	Fairfield High School	240	14.00, Oct.-Dec. 2004 13.00, Aug.-Sept. 2004 16.00, April-June 2004 14.60, Jan.-March 2004	Non-Transient Violations not in SDWIS
KS2119308	KDOT EB	25	12.0, April-June 2004 12.4, Jan.-March 2004	Non-Transient Violations not in SDWIS
KS2117304	Maize Intermediate School	870	11.0, Jan.-March 2003	Non-Transient Violations not in SDWIS
KS2115513	St. Joseph's Catholic School (Elementary)	100	26.0 11.0	Non-Transient Closed?
KS2105525	Tyson Fresh Meats, Inc	2900	15, Dec. 2004 13, Nov. 2004 14, Oct. 2004 13, Sept. 2004 14, July 2004 14, June 2004 15, May 2004 12, April 2004 20, March 2004 19, March 2004 19.4, Feb. 2004 22.1, Jan. 2004 21.0, Jan.-March 2003 27.1, July-Sept. 2003 23.16, July-Sept. 2002	Currently under Administrative Order Exceeded 20 mg/L, N-Waiver

Appendix B

Almena, City of: This municipality serves a population of 461 and surpassed the nitrate MCL in twelve quarters, between 1995 until 2003. Exceedance levels ranged from 10.73 mg/l to 13.75 mg/l. The system was placed under the Strategy through an Administrative Order in September 2001. In 1998, nitrate was reported as nitrite, and two consecutive MCL violations occurred. However, the system was not placed under the Strategy until two consecutive nitrate violations occurred in the quarters of January 2001 and April 2001. Proof of public notice was found in the file for some violations, but was missing for violations occurring in October 2000 and January 2001. Nitrate concentrations were incorrectly reported in the Annual Consumer Confidence Report (CCR) of 2000 as 1.7 mg/l and in 2001 as 3.01 mg/l. The system was returned to compliance in November 2004, as the system had gone four consecutive quarters without exceeding the nitrate MCL. While the reason justifying a decrease in nitrate concentrations is uncertain, public notifications dated May 20, 2002 and July 2003 indicated that the City was considering blending at that time. Other correspondence in the file dated September 3, 2004 indicated that the City was considering installation of four new wells.

Argonia, City of: This municipality serves a population of 524 and surpassed the nitrate MCL in eight quarters, between January 2003 through March 2005. Exceedance levels ranged from 10.90 mg/l to 12.00 mg/l. The system was placed under an order in September 2003, in accordance with the terms and conditions of the Strategy. Proof of public notice was available for all nitrate violations, with the exception of February 2005. Several notices lack reference to provision of an alternative water supply. According to the file, the system has not examined treatment or new source options. However, KDHE noted through correspondence to EPA that this system is being assessed jointly with Conway Springs in order to establish a viable source of drinking water.

Arlington, City of: This municipality serves a population of 452 and surpassed the nitrate MCL in seven quarters, with an additional monitoring violation, between July 2003 through March 2005. The system was placed on quarterly sampling after it exceeded the nitrate MCL in April 2002. Exceedance levels ranged from 10.91 mg/l to 14.00 mg/l. The system was placed under an order in May 2003, in accordance with the terms and conditions of the Strategy. Proof of public notice was submitted for all violations, with the exception of February 2004. Correspondence in the file dated September 15, 2003 indicates that the system was granted a \$250,000 loan. The City requested a preliminary engineering report in September 2004 and is working towards achieving compliance in what appears to be a timely manner.

Conway Springs, City of: This municipality serves a population of 1308 and exceeded the nitrate MCL in sixteen quarters between January 1995 until December 2004, with additional nitrate violations occurring prior to 1995. Exceedance levels ranged from 10.54 mg/l to 11.43 mg/l. The City also provides water to the City of Viola and Sumner County RWD #5. EPA placed the system under an order in December 1994. Correspondence in the file dated June 26, 1997 indicates that the City proposed to install a de-nitrification plant. However, that course of action was not sought, as the system was placed under an order by KDHE in December 1997, in accordance with the terms and conditions of the Strategy. The system was issued a boil water advisory for coliform violations in January 2005, which has the potential to increase the

concentration of nitrates. Public notification has occurred, though never within the 24 hour timeframe. Every public notification submitted for nitrate was posted within one week at the earliest. According to 40CFR141.202 (b)(1), public notification must be conducted “as soon as practical but no later than 24 hours after the system learns of the violation.” Public notification forms sent to the system by KDHE state that “public notice is to be performed within 24 hours or as soon as practical.” The 24 hour requirement should be presented more clearly to the system. The mandatory language for nitrate violations was not included in the CCR until 2002. The file contains no information documenting that the City is seeking alternative solutions to decrease nitrate levels, nor discusses wellhead protection and funding. It appears as though Conway Springs has not made any attempt to reduce their levels of nitrate. A spreadsheet which KDHE uses to track the status of systems under the Nitrate Strategy states that an engineer is currently evaluating source or treatment options. Reducing nitrate levels is not a requirement under the Strategy. Correspondence in the file indicates that KDHE attended a meeting held by the City to discuss application of the Nitrate Strategy on February 28, 2005. Since the Order expired in December 2004, the City inquired about a “do nothing” option regarding their nitrate exceedances. KDHE informed the City that the water needed to either be treated, or a new source sought. The City is considering a project that would provide quality drinking water jointly to Conway Springs, Norwich and Argonia. KDHE permitted the City additional time to explore this option at the meeting. KDHE has not renewed the Strategy, as they are awaiting comments from EPA.

Gaylord, City of: This municipality serves a population of 138 and exceeded the nitrate MCL in eleven quarters between January 1997 until March 2004, with additional nitrate violations occurring prior to 1997. The City also failed to monitor for two quarters in 2003. Exceedance levels ranged from 12.000 mg/l to 27.48 mg/l. The system was placed under an order in December 1997, in accordance with the terms and conditions of the Strategy. An alternative source of water was provided, and advertised through the public notice. The City exceeded 20 mg/l in two consecutive quarters which began in January and April 1998. There is no documentation in the file which indicates that the City needs to seek further action due to the increased nitrate concentrations. The file contains no information documenting that the City is seeking alternative solutions to decrease nitrate levels, nor discusses wellhead protection and funding until August 2001. In August 2001, the City opted to blend two wells. Blending took effect in April 2004, several months prior to when the Order was to expire. Since that time, levels of nitrate have been below the MCL. The reason for the City’s delay in seeking resolution is uncertain. From the information present in the files, it appears as though the seven year time frame allocated through the Strategy enabled the City to delay response. Additionally, repeat samples were taken at intervals greater than the regulations allow. Under 40 CFR 141.23, the system is required to take a confirmation sample within 24 hours from when an exceedance of the MCL is detected. When samples are not taken within this frequency, sampling may not be representative of nitrate levels. For example, files indicate that a sample was taken on February 18, 1998, detecting a concentration of 47.80 mg/l. A repeat sample was taken one month later, on March 17, 1998, detecting a concentration of 7.16 mg/l. When averaged together, the result was reported as 22.94 mg/l. A sample taken closer to the date in which nitrate was detected could have led to an increase in the actual concentration of nitrate reported to SDWIS. Additionally, the system did not submit public notification in a timely manner, and failed to submit public notification for violations occurring in July 2001, October 2001 and January 2004.

Greenleaf, City of: This municipality serves a population of 349 and exceeded the nitrate MCL in nine quarters between April 2001 until June 2004. Exceedance levels ranged from 10.6 mg/l to 12.00 mg/l. The system was placed under an order in February 2002, after three consecutive quarters of nitrate violations, in accordance with the terms and conditions of the Strategy. According to 40CFR141.202 (b)(1), public notification must be conducted "as soon as practical but no later than 24 hours after the system learns of the violation." Public notification forms sent to the system by KDHE state that "public notice is to be performed within 24 hours or as soon as practical." The 24 hour requirement should be presented more clearly to the system. Public notice was conducted 1-2 weeks after the violation occurred. Nitrate MCL exceedances are referenced in correspondence dated February 25, 2002, as occurring on April 26, 1999 and June 7, 2000, but do not appear in SDWIS. A feasibility study was conducted on April 15, 2003 to assess the potential for the City to connect with Washington RWD. The outcome of this study was not documented in the files.

Harper County RWD #4: This rural water district serves a population of 320 and exceeded the nitrate MCL in seven quarters between January 2003 through March 2005, with exceedance values ranging from 10.90 to 12.00. The system purchases water from the City of Argonia, a municipality which is also under the Nitrate Strategy. The City was placed under the Strategy in November 2003, two months after Arlington. Customers who need an alternative source of water are referred to the City of Argonia.

Hiawatha, City of: This municipality serves a population of 3306 and exceeded the nitrate MCL in nineteen quarters between January 1997 until June 2003, with additional nitrate violations occurring prior to 1997. Exceedance levels ranged from 10.64 mg/l to 13.17 mg/l. The system was placed under an order in April 1998, in accordance with the terms and conditions of the Strategy. Proof of public notice was submitted, though not in a timely manner. The file contains no information documenting that the City sought alternative solutions with the intentions of reducing nitrate levels, nor was wellhead protection or funding discussed. In April 2003, the system was notified that it was a system under the influence of groundwater, and therefore, was required to comply with the Surface Water Treatment Rule. Compliance with this rule would require additional monitoring and added expense. Therefore, the City opted to abandon well #3 and install a new well. Well #3 was also the source of high nitrates. Once the well was taken off-line, nitrates dropped below the MCL. The original well was taken off-line in July 2003 and a new well was completed in November 2004. This solution seemed to come quickly when it was necessary to comply with the Surface Water Treatment Rule. Funding appears to have been available for action to have been taken in a more timely manner in response to non-compliance with the nitrate MCL. Improved communication with the system on the need to comply with the MCL for nitrate could have led to a more timely response.

Jefferson Co RWD #15: This rural water department serves a population of 228 and exceeded the nitrate MCL in twenty-four quarters between April 1996 until December 2004, with a monitoring violation occurring in January-March 2002 and additional nitrate violations occurring prior to 1996. Exceedance levels ranged from 10.77 mg/l to 15.38 mg/l. The system was placed under an order in 1997, in accordance with the terms and conditions of the Strategy, which replaced an order administered in 1994. An administrative order with penalty was administered

in May 2002 due to non-compliance with the Nitrate Strategy, failure to conduct public notification and non-compliance with the lead and copper rule and total coliform rule. The Order required the City to submit a written report stating why they had not complied with the Nitrate Strategy, conduct a feasibility study, submit public notification, and continue monitoring. The penalty totaled \$1,500 and was paid in full in 2003. EPA terminated the order in late May 2002 for failure to comply with the CCR. Correspondence with the RWD in August 2002 indicated that the district had the funds necessary to correct the system. The system decided in October 2004 to connect with Jefferson Co RWD #1 and began laying the pipe in March 2005. The anticipated date of completion is not documented in the file.

Jewell Co RWD: This municipality serves a population of 959 and exceeded the nitrate MCL in thirty-five quarters between October 1995 until September 2004, with additional nitrate violations occurring prior to 1995. Exceedance levels ranged from 11.00 mg/l to 15.81 mg/l. The system was placed under an order in October 1997 due to the formation of the Nitrate Strategy several months prior. During this time, public notice was provided by the supplier, The public notice was delivered to health care facilities, as specified under the Strategy, though the notification did not communicate the steps the system was taking to come into compliance and when the system was expected to return to compliance. Under the terms of the Strategy, systems detecting concentrations that range from 10-15 mg/l are to examine options for a new source or treatment, wellhead and funding. These options were examined, though not until 2001-2002. Wellhead protection began in 2001. Funding for a new supply was sought in 2002. The system was out of compliance for four years before the RWD responded to the terms outlined in the Order. The system exceeded 15 mg/l for two consecutive quarters beginning in October 1999 and January 2000. Under the terms of the Strategy, a new treatment was to be proposed at that time, based on a feasibility study prepared by an engineer. While the feasibility study was not in the file, the RWD made a decision to install new wells in June 2003. Funding was requested and granted for additional wells in November 2004. These actions were not taken in a timely manner. The City of Lebanon was once connected to Jewell Co RWD, and sought action against the RWD to release them of their contract to purchase water from the RWD on the basis that "the quality of water has been getting worse, not better." The City of Lebanon disconnected from Jewell in July 2001 and sought a sustainable source of water. The seven-year term outlined by the Strategy to come into compliance has expired for Jewell Co RWD. KDHE has not renewed the Strategy, as they are awaiting comments from EPA.

Long Island, City of: This municipality serves a population of 152 and exceeded the nitrate MCL in twenty-five quarters between January 1997 until June 2003, with additional nitrate violations occurring prior to 1997. Exceedance levels ranged from 15.30 mg/l to 27.02 mg/l. The system was placed under an order in October 2003, in accordance with the terms and conditions of the Strategy. Proof of public notice was submitted for most violations, with the exception of November 1999, July 2000, October 2000 and January 2001, though not always posted with the time frames required in the Public Notification Rule. In December 1999, KDHE sent a letter to the City stating that a feasibility study was required under the Consent Order, and had not been received. The City drilled sixteen holes to test for a new well in January 2000, none of which met the MCL for nitrate. None of the In July 2000, KDHE sent a letter to the City notifying them of their failure to monitor. On July 25, 2000, the City drilled a new well. High

nitrate levels persisted. The City surpassed 20 mg/l in April 2000. KDHE notified the City of the violation, though the City was not reminded that further action was required in accordance with the Order. The City requested in July 2001 to begin installation on a new well the following Spring. KDHE approved the request. The City applied for a loan in January 2001. The City began construction of the new well in August 2002, and was permitted in the fall of 2003. The City sampled below the MCL for four consecutive quarters, from July 2003 until June 2004. The Consent Order was terminated in November 2004, and the City received permission to switch to annual monitoring in January 2005. The seven year time frame allocated through the Strategy places a deadline of 2005 for the City to come into compliance. The City was able to meet this deadline, even with the additional year it took to submit a feasibility study and the time pressure that was exerted to find a new well.

Kirwin, City of: This municipality serves a population of 226 and exceeded the nitrate MCL in nineteen quarters between January 1995 until June 2004, with additional nitrate violations occurring prior to 1995. Exceedance levels ranged from 11.00 mg/l to 27.86 mg/l. The City was placed under an order by EPA in August 1995 which included a compliance schedule. A status of the City's compliance with the established milestones was requested in 1997, in which the City responded that the City was searching for a new well field. The City began supplying bottled water in August 2001 and EPA terminated the Order at that time. A feasibility study to install new wells was conducted in June 2002. KDHE approved the plans in August 2002 and the City completed construction of the wells in April 2003. Levels of nitrate which exceeded the MCL were detected in the new well in June 2004.

Norwich, City of: This municipality serves a population of 543 and exceeded the nitrate MCL in nine quarters between October 1996 until December 2004, with additional nitrate violations occurring prior to 1996. Exceedance levels ranged from 11.91 mg/l to 15.55 mg/l. The system was placed under an order which includes the terms of the Nitrate Strategy in May 1998, after incurring two consecutive violations, which ended in March 1998. The order was terminated in December 2001, when nitrates were below the MCL for four consecutive quarters from January 2001 until December 2001. One year and nine months after the order was terminated, nitrate levels exceeded the MCL and were initially detected at 14.00 mg/l. A new order was administered which included the terms of the strategy in June 2004. Because the Strategy provides for a seven year timeframe from the date of issue, the City now has until 2011 to come into compliance under the terms of the Strategy. Files provide little documentation to indicate that the City has sought a new water source, participated in wellhead protection, or examined the potential for funding. The Strategy requires that these criteria be evaluated when nitrate was first detected above the MCL, or when the system was first placed under an order in May 1997. Additionally, the City missed two years of monitoring in 1999 and 2000. Nitrate was first detected above 15.00 mg/l in 1998. Because the City failed to monitor, there is no indication of whether nitrate persisted at these high levels in proceeding quarters. While the terms of the order were unfulfilled, KDHE chose not to seek further action.

Plains, City of: This municipality serves a population of 1171 and exceeded the nitrate MCL in four quarters between July 2003 and June 2004. Exceedance levels ranged from 11.00 mg/l to 12.00 mg/l. The system was placed under an order in March 2004, in accordance with the terms and conditions of the Strategy. A well was taken off-line in June 2004, lowering nitrate levels to

below the MCL. A new well is in the process of being built, which will return the system to compliance.

Pretty Prairie, City of: This municipality serves a population of 610 and exceeded the nitrate MCL in fifteen quarters between January 1995 and December 2004. Exceedance levels ranged from 10.52 mg/l to 13.65 mg/l. EPA administered an Order in January 1994. In response to the order, the City drilled new wells. Once in operation, the new wells exceeded the MCL for nitrate. While not yet formulated, KDHE placed the system under an order similar to the Nitrate Strategy in October 1996 and EPA dismissed their previous order. The terms of the Order, which later formed the Nitrate Strategy, were intended to promote wellhead protection. The wellhead protection plan was approved in October 2000. The system continued to exceed the nitrate MCL. In May 2003, Kansas Rural Water proposed to test the irrigation wells for nitrate to determine whether the wells would be suitable for consumption in the future, if necessary. The Order expired in October 2003, and remains out of compliance. KDHE has not renewed the Strategy, as they are awaiting comments from EPA.

Robinson, City of: This municipality serves a population of 208 and exceeded the nitrate MCL in eight quarters between January 1995 until September 2003. The nitrate MCL was exceeded in 1995, with concentrations occurring at 11.0 from January-June 1995. The nitrate MCL was not exceeded again until April 1999, with a detection of 12.06 mg/l. Since that time, six exceedances have occurred, ranging in concentration from 11.0 mg/l to 12.34 mg/l. KDHE placed the City under an order in January 2001, which required the City to take from well #2 only, and place well #7 and #8 on emergency use. The City entered into a consent agreement with KDHE in May 2001 re-opening wells #7 and #8 for blending. KDHE required weekly monitoring for three months to ensure that blending was reducing nitrate concentrations to below the MCL. The City's monitoring frequency was reduced to monthly in October 2001. Another consent agreement was signed in January 2003 taking well #7 off-line. The City had an additional nitrate violation in the quarter beginning with July 2003, barely exceeding the MCL. The City has not exceeded the MCL for nitrate since that time.

Sumner Co RWD #5: This rural water district serves a population of 850 and exceeded the nitrate MCL in sixteen quarters between January 1995 until December 2004, with additional nitrate violations occurring prior to 1995. Exceedance levels ranged from 10.54 mg/l to 11.43 mg/l. The RWD is connected to Conway Springs, and serves water to Viola, and therefore, has the same pattern of nitrate exceedances. Though not in the file, SDWIS indicates that the system was placed under an order by KDHE in February 2003. The terms of the Strategy require that an order be issued after two consecutive exceedances. Nitrate MCL violations occurred consecutively for the quarters beginning with July and October in 2000. However, KDHE did not send an order since the system's water originates from Conway Springs, which was already under an order. Conversations with KDHE indicated that KDHE had not responded to the violations due to EPA involvement. Public notification has occurred, though not within the 24 hour timeframe, nor indicating how bottled water can be obtained. Public notification was not provided for the quarter April-June 2004. The mandatory language for nitrate violations was originally not included in the 2002 CCR, though KDHE sent notice to the system requiring that the CCR be re-issued to include this information. The RWD does not plan to examine alternative sources, as it is relying on the actions of Conway Springs.

Viola, City of: This municipality serves a population of 215 and exceeded the nitrate MCL in sixteen quarters between January 1995 until December 2004, with additional nitrate violations occurring prior to 1995. Exceedance levels ranged from 10.54 mg/l to 11.43 mg/l. The City is connected to Sumner Co RWD, which receives their water from Conway Springs, and therefore, has the same pattern of nitrate exceedances. The system was placed under an order by KDHE in February 2003. The terms of the Strategy require that an order be issued after two consecutive exceedances. Nitrate MCL violations occurred consecutively for the quarters beginning with July and October in 2000. However, KDHE did not send an order since the system's water originates from Conway Springs, which was already under an order. Conversations with KDHE indicated that KDHE had not responded to the violations due to EPA involvement. Public notification has occurred, though not within the 24 hour timeframe. The City does not plan to examine alternative sources, as it is relying on the actions of Conway Springs.



{In Archive} Fw: Briefing Materials: MO APE,N Strategy Enforcement Findings

Diane Huffman to: Rochelle Gibson

07/11/2006 10:59 AM

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----- Forwarded by Diane Huffman/WWPD/R7/USEPA/US on 07/11/2006 10:58 AM -----



Kimberly
Harbour/WWPD/R7/USEPA/US

07/07/2006 10:01 AM

To Betty Berry/WWPD/R7/USEPA/US@EPA, Mary Mindrup/WWPD/R7/USEPA/US@EPA, Diane Huffman/WWPD/R7/USEPA/US@EPA
cc Rochelle Gibson/WWPD/R7/USEPA/US@EPA, Mary Carter/ARTD/R7/USEPA/US@EPA, Robert Dunlevy/WWPD/R7/USEPA/US@EPA, Neftali Hernandez-Santiago/WWPD/R7/USEPA/US@EPA
Subject Briefing Materials: MO APE,N Strategy Enforcement Findings

Attached, please find the draft enforcement findings of the Missouri Annual Program Evaluation, which took place June 6-9, 2006 and the Kansas Nitrate Strategy Evaluation, which took place April 20-21, 2005 and is now being finalized.

I am providing these materials to you in advance of the briefing scheduled for Monday, July 10 at 11am. Please note that editing changes may occur in the draft APE, per discussion with Diane, but the content will remain the same. Bob Dunlevy is working on the APE as well. We plan to meet the 30-day timeframe for APEs. Since I am leaving town, Diane and I wanted to ensure you had the opportunity to discuss the findings with me before the draft is submitted to the MDNR.

I will deliver a paper copy of these reports to Betty, Mary M. and Diane this morning, so that the report is called to your attention and will save printing time.

MO APE Documents:



Table Contents 06.doc DraftBriefingAPE06.doc Appendix D.pdf

N Strategy:



Final Nitrate Strategy Review.doc

Thanks,
Kim

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{In Archive} Briefing Materials: MO APE,N Strategy Enforcement Findings

Kimberly Harbour to: Betty Berry, Mary Mindrup, Diane Huffman

07/07/2006 10:02 AM

Cc: Rochelle Gibson, Mary Carter, Robert Dunlevy, Neftali Hernandez-Santiago

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Thanks,
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Evaluation of the Nitrate Strategy

Implemented among Public Water Systems

By the Kansas Department of Health and Environment

Conducted by the EPA, Region 7
April 20 – 21, 2005

I. INTRODUCTION

Concentrations of nitrate which exceed the Maximum Contaminant Level (MCL) occur frequently among Public Water Systems (PWSs) in Kansas. On March 25, 1997, the Kansas Department of Health and Environment (KDHE) entered into an agreement with Region 7 of the Environmental Protection Agency (EPA) termed the "Nitrate Strategy" to establish a response procedure for the KDHE to address PWSs which have a recurring history of nitrate violations. According to §141.62(b) the MCL for nitrate is 10 mg/L when measured as nitrogen and applies to all community water systems; non-transient, non-community water systems; and transient non-community water systems. Under §141.11(d), nitrate levels not to exceed 20 mg/l may be allowed in a non-community water system if the supplier of water demonstrates it meets specific criteria to the state. The Strategy was designed to apply to PWSs which exceed the nitrate MCL in two of three consecutive quarters, and requires escalation when nitrate levels exceed 15 mg/L and 20 mg/L in two of three consecutive quarters. All systems eligible under the Strategy were to receive administrative consent orders or administrative orders consistent with the terms and conditions identified in the Strategy, where the order would expire seven years from the date in which it was issued. At that point, the KDHE and the EPA would review each system which entered into an order consistent with the Strategy to determine whether extensions would be granted.

During the Annual Program Evaluation for 2003, conducted in April 2004, the EPA reviewed several PWSs under the Nitrate Strategy and recommended that the Strategy be evaluated. On April 20-21, 2005, the EPA conducted a file review which was initiated by the Water Enforcement Branch and included representation from legal counsel and the Drinking Water Management Branch. Twenty-seven PWSs that exceeded the nitrate MCL of 10 mg/L were examined. Sixteen of the files were for community water systems in which the Nitrate Strategy had been applied (City of Almena, City of Argonia, City of Arlington, City of Conway Springs, City of Gaylord, City of Greenleaf, Harper Co. RWD #4, City of Hiawatha, City of Norwich, Jefferson Co RWD #15, Jewell Co RWD #1, City of Long Island, City of Plains, City of Pretty Prairie, Sumner Co RWD #5, City of Viola). Two of the files were for community water systems that qualified for the Nitrate Strategy, though the KDHE chose to seek alternatives to address the systems (City of Kirwin, City of Robinson). Three of the files were for community water systems not yet meeting the criteria for inclusion under the Nitrate Strategy (City of Grainfield, City of Lucas, City of Solomon). Six of the files were for non-community water systems in which the KDHE had extended the level of nitrates to 20 mg/L, as permitted under 40 CFR 141.11(d) (Colwich Elementary School, Fairfield High School, KDOT EB, Maize Intermediate School, Pratt Airport and Tyson Fresh Meats).

The results of the file review regarding the Nitrate Strategy are included in this report. Since the majority of PWS listed on the Unaddressed SNC Report are for nitrate MCL exceedances, this report replaces the Annual Program Evaluation of enforcement activity occurring in 2004.

II. EVALUATION OF COMPLIANCE WITH THE STRATEGY

NON-COMMUNITY WATER SYSTEMS

The "APPLICABILITY" section of the Strategy states "The Bureau of Water will apply this strategy to community water supplies. Non-community supplies (both transient and non-transient) are allowed nitrate levels up to 20 mg/L as nitrogen, subject to certain posting and public education requirements."

Under 40 CFR 141.11, nitrate levels not to exceed 20 mg/L are permissible for non-community water systems when four criteria are met:

- 1) The non-community water system has demonstrated to the State that water will not be available to children under 6 months of age;
- 2) Public Notice is continually posted;
- 3) Local and State health authorities are notified annually of nitrate levels that exceed 10 mg/L; and
- 4) No adverse health effects result.

Although non-community water systems with Nitrate exceedances over 10 mg/L and under 20 mg/L are not listed in SDWIS, the EPA reviewed six non-community water systems in which nitrate levels exceeded 10 mg/L to evaluate the implementation of the requirement under 141.11. The systems reviewed were: KDOT Colby Rest Stop East Bound (KS2119308), Fairfield High School (KS2115514), Maize Intermediate School (KS2117304), Colwich Elementary School (KS2115513), Pratt Airport (KS2115101) and Tyson Fresh Meats, Inc. (KS2105525). The files contained evidence to support that public notice was continually posted and no known adverse health effects had resulted. The files lacked documentation to support that the supplier had demonstrated to the State that the water being served was not available to children under 6 months of age, particularly among systems where infants could potentially drink the water, such as KDOT Colby Rest Stop, Pratt Airport and Colwich Elementary School. In recent months, Fairfield High School has omitted language cautioning pregnant or nursing mothers of the violation. This omission was corrected by the KDHE upon notification during the review.

The 20 mg/L level for nitrate is currently permitted among three of the systems, where the other three systems have either reached levels above 20 mg/L or have connected to other sources. Both Colwich Elementary and Maize Intermediate are no longer operating as individual systems, and have since connected to municipal systems. Tyson Fresh Meats exceeded 20 mg/L in January-March 2002, July-September 2002, October-December 2003 and January-March 2004. The KDHE administered an order to seek corrective action in March 2004, as required by regulation. Meanwhile, bottled water is being provided.

REQUIREMENTS FOR COMMUNITY WATER SYSTEMS

The "STRATEGY" section of the Nitrate Strategy requires all community water systems that exceed nitrate levels of 10 mg/L to give public notice. The Strategy further states, "The public notice will include a recommendation to seek an alternative source of water for infants under six months of age, mothers nursing infants under six months of age, and pregnant women. The public water systems will also be required to continue quarterly monitoring as required by regulation."

Several community water systems, which exceeded nitrate levels but were not required to meet further conditions outlined in the Strategy were evaluated. These files were selected to verify that the KDHE was applying the Strategy when applicable, and to ensure that Nitrate MCL violations not meeting the criteria for the Nitrate Strategy were treated in accordance with federal regulations.

The systems selected were: City of Grainfield (KS2006302), City of Lucas (KS2016702), and City of Solomon (KS2004105). Information in the files supports that none of these systems incurred nitrate violations in two of any three consecutive quarters, and, therefore, are not subject to the Nitrate Strategy. The systems are still subject to the Public Notification requirements. Public notice was posted for all three systems and bottled water was made available for infants and pregnant women. Public notice was not posted within 24 hours. Regulations published on May 4, 2000 require that public notice be provided to all systems that exceed the level for nitrate within 24 hours. This requirement is set forth under 40 CFR 141.202.

Documentation in the files supports that the KDHE is addressing systems which experience nitrate exceedances, but do not qualify under the Strategy. The system history documented for Grainfield indicates that while only two nitrate exceedances have occurred, the KDHE is in correspondence with the City to seek an alternative water supply. The Nitrate exceedance for the City of Solomon occurred from improper sampling, and was not reflective of the quality of water supplied to the public. The City of Lucas currently has treatment installed which should reduce nitrate concentrations.

PWS IN VIOLATION FOR ANY 2 OF 3 CONSECUTIVE QUARTERS

PWS in violation for nitrate within two of three consecutive quarters must meet additional requirements, as outlined by the Strategy. Additional requirements fall into four categories: 1) Monitoring 2) Public Notification 3) Providing an Alternative Source of Water and 4) Corrective Actions. A summary of violations for systems evaluated, including systems that qualified for the Nitrate Strategy, are listed in Appendix A.

1. **MONITORING**—The Strategy allows for the KDHE to increase the frequency of monitoring to monthly when necessary to establish the trend of nitrate concentrations.

Of the systems reviewed which were under the Strategy, none were on monthly monitoring. Though nitrate levels were stable for most systems, several systems reported varying levels, such as Gaylord, which may have justified monthly sampling.

2. **PUBLIC NOTIFICATION**—As noted earlier in this report, 40 CFR 141.202 mandates that public notice be provided to all systems which exceed the nitrate level within 24 hours, as published on May 4, 2000.

Of the eighteen PWSs reviewed in which the Strategy was applied, none were found to be in compliance with the 24-hour public notification requirement. Specific examples of the timeframes in which the KDHE has implemented the public notification requirements are included in the individual system histories, located in Appendix B.

The Strategy dictates that the public notice “will be provided to all local health care providers, including medical doctors, clinics, hospitals, and the appropriate local county health department,” as well as “day care providers and commercial establishments serving the traveling public, such as restaurants and roadside parks.” Four of the eighteen systems—Jewell, Long Island, Norwich and Plains—provided information to the KDHE which indicates the notice had been distributed to facilities meeting this description. Conversations with the KDHE staff revealed that the notice is often distributed to the county health department per the initiative of the KDHE, which partially fulfills the Strategy requirements. Receipt of the public notification among day cares and traveling public establishments is uncertain since the files do not contain this documentation.

The public notice must also describe the alternative water program. The public notice typically claimed that bottled water was being provided. Contact information was sometimes provided to inquire about the alternative water program, but few notices contained language describing specifics of where and how to obtain the bottled water.

3. **ALTERNATIVE SOURCE OF WATER**—The Strategy necessitates that the public water system shall provide an alternative source of drinking water to all infants under six months of age, and mothers nursing infants under six years of age free of charge.

The public notice indicates that this is being conducted, typically through provision of bottled water. According to the Strategy, the system is required to submit a proposal indicating how the water will be supplied. Files did not contain information regarding these proposals.

4. **CORRECTIVE ACTIONS**—The extent of corrective actions mandated under the Strategy depends on the concentration of nitrate reported for the system. Findings of the corrective actions portion are organized in this report accordingly.

SPECIAL REQUIREMENTS FOR SYSTEMS BETWEEN 10-15 mg/L

When nitrate is detected at levels ranging from 10-15 mg/L in any two of three consecutive quarters, the system is required to evaluate the feasibility of seven options which may remedy the nitrate exceedances. These seven solutions include: i) Obtaining a new source of water ii) Blending iii) Purchasing from a provider that meets federal and state regulations iv) Connecting with a nearby provider that meets federal and state regulations v) Removing the source contributing to high nitrate levels from service vi) Participation in wellhead protection vii) Reviewing funding through the Community Development Block Grant program or Rural Economic Development agency.

Twenty systems were identified as incurring violations that ranged from 10-15 mg/L, and thus needed to fulfill the aforementioned requirements. The EPA evaluated sixteen of these systems. Of the sixteen systems reviewed, steps taken to fulfill the requirements outlined in this section of the Strategy were only documented in seven of the systems. Of those seven systems, three fulfilled the requirements in a timely manner. Systems in which documentation exists to support that options were discussed include Arlington, Gaylord, Jefferson Co. RWD #15, Jewell Co RWD #1, Long Island, Plains and Pretty Prairie. Of these systems, the cities of Arlington, Long Island and Plains have fulfilled their responsibilities outlined in the Strategy. The cities of

Gaylord, Jefferson Co. RWD #15, Jewell and Pretty Prairie evaluated several of the options required under the Strategy, but timeliness could have been improved.

The City of Arlington has selected treatment in the case that nitrate levels increase, which may be considered as meeting the first proposed solution of the Strategy—obtaining a new source of water. Two visits from the Kansas Rural Water Association (KRWA) are documented in the file, proposing a new well in Feb. 2003, immediately after the system exceeded nitrate levels in two consecutive quarters. Funding was secured in Sept. 2003. A follow-up visit was made by KRWA, indicating that the City had requested a preliminary engineering report.

The City of Plains evaluated the option of blending water within a year, as documented in the file.

The City of Long Island evaluated construction of a new well and secured funding two and a half years after the Order was issued. It was not necessary for these systems to evaluate the feasibility of other options since a solution was implemented.

The City of Gaylord eventually was returned to compliance for remedying their high levels of nitrate. The City was placed under the Nitrate Strategy in 1997, and began blending in 2003. However, the file lacks information to support the steps taken for the City to reach that point.

Jefferson Co RWD #15 examined the possibility of connecting with another PWS, obtaining a new water source and securing funds. However, the Order was administered in 1997, and options were not evaluated until 2002. The KDHE sent a Penalty Order to prompt further action from the supplier, requiring a feasibility study.

Jewell Co RWD #1 sought evaluation of these steps once they had surpassed nitrate levels of 15 mg/L. The system includes a publication entitled “Water Works” with their Consumer Confidence Report (CCR) every year. These publications communicate the progress of their search for a new water source, potential of connecting with a new system, wellhead protection and status of funding through the Community Block Development Grant. In the instance of Jewell Co RWD #1, this section of the strategy was met, though not in a timely manner. While the system was placed under the Order in 1997, activity was not initiated until 2001. Action was triggered by a response to nitrate levels that surpassed 15 mg/L. According to the Strategy, these options are to be explored once a system has passed 10 mg/L. Jewell Co RWD #1 was in exceedance for nitrate prior to 1995, when violations were first reported to SDWIS.

The City of Pretty Prairie was quick to evaluate the option of wellhead protection. However, other options were not documented in the file. Selecting this option did not resolve the issue long-term, as the system is still in violation for nitrate.

SPECIAL REQUIREMENTS FOR SYSTEMS BETWEEN 15-20 mg/L

When nitrate levels exceed 15 mg/L in two of three consecutive quarters, the Nitrate Strategy calls for preparation of a formal feasibility study, prepared by a professional engineer. Of the twenty systems in which the Nitrate Strategy was applied, four systems reported levels above 15 mg/L in two consecutive quarters, all of which were evaluated by the EPA: Gaylord, Jewell Co RWD #1, and Long Island. Jefferson Co RWD #15 also surpassed 15 mg/L. Though not documented, feasibility studies were most probably conducted for Gaylord and Long Island, as the systems have assessed installment of new wells and blending options. Since timing of the

feasibility study is not documented, it is difficult to determine whether the report was conducted in a timely manner.

The City of Gaylord exceeded nitrate levels above 15 mg/L in two consecutive quarters through samples taken in quarters that began in January 1998 and April 1998. The City began blending in 2004, indicating that a preliminary engineering report was most likely drafted, but was not made available in the file.

Jewell Co RWD #1 exceeded nitrate levels above 15 mg/L in two consecutive quarters, incurring violations in October 1999 and January 2000. A feasibility study was conducted in 2002, which includes a proposed treatment to reduce nitrates, and cost estimates, as required by the Strategy. While the conditions of the Strategy were satisfied, timeliness could have been improved.

The City of Long Island had exceeded nitrate levels greater than 15 mg/L in two of three consecutive quarters prior to being placed under the Strategy in 1997. Long Island began a study by drilling test wells in May 1999. The KDHE sent a reminder to the supplier in December 1999, requesting that a feasibility study be submitted. Results of the May 1999 study were submitted to the KDHE in 2000. New wells were installed in 2002.

SPECIAL REQUIREMENTS FOR SYSTEMS ABOVE 20 mg/L

When nitrate levels exceed 20 mg/L in any two of three consecutive quarters, the Nitrate Strategy dictates the supplier to implement the most feasible option previously identified when nitrate ranged from 10-15 mg/L. Of the twenty systems in which the Strategy was applied, the City of Long Island is the only one that exceeded 20 mg/L for nitrates in two or more consecutive quarters.

The City of Long Island exceeded 20 mg/L in the quarters beginning with April 2000 and July 2000. The KDHE sent a letter to the supplier dated July 27, 2000, requiring quarterly monitoring. The system was not notified in the letter that treatment was required. On June 14, 2001, the KDHE sent a letter to the system stating that proof of public notice had not been received for the past four violations. Funding for the new wells was secured in Spring 2001 and construction began in August 2002. In this instance, Strategy requirements for obtaining a new source were fulfilled. Public notice requirements were deficient.

IMPLEMENTATION

According to the Strategy, all agreements were to be implemented with an administrative consent order or administrative order. All systems under the Nitrate Strategy received orders, which clearly laid out the terms of the Strategy. The Strategy states that "Appropriate time frames for completion of the activities will be negotiated with the public water system." Documentation to support negotiation of time frames does not exist in the files. The Strategy also provides a provision to automatically terminate the order for systems that meet the MCL for nitrate for four consecutive quarters. None of the systems under the Strategy have met this criteria without change to the system. However, several PWSs have been returned to compliance after four quarters of monitoring without an exceedance as a result of treatment, blending or a new well field being installed. These PWSs include: Almena, Bazine, Burr Oak, Gaylord, Grant County Feeders, Hiawatha, St. George, White City, Green, Kirwin, and Robinson. The Strategy further states that after seven years, the KDHE and the EPA will re-evaluate the application of

the Strategy among systems that have not returned to compliance. Criteria used for reevaluation include: whether the trend of nitrates is increasing or decreasing, amount of usage from points of entry, extent of participation in the wellhead protection program and availability of funding. PWSs have not reached compliance through Compliance has not been achieved exclusively as a result of wellhead protection. A natural, steady decline of nitrates was not exhibited by any of the systems. In general, nitrate levels have increased or fluctuated when changes to the system had not been made. Participation in a wellhead protection program was mentioned in two files: Jewell Co RWD #1 and Pretty Prairie. The files lack documentation regarding involvement in wellhead protection, amount of usage in comparison to nitrate concentrations and funding. More specific evaluation of these criteria is included in Appendix B.

III. CONCLUSION

The Nitrate Strategy was originally intended to guide PWSs into compliance by encouraging PWSs to evaluate all options and determine the most effective means to reach compliance. PWSs were allowed considerable time to attempt wellhead protection and secure funding. While several PWSs, such as City of Plains, City of Gaylord, City of Long Island and City of Green have reached compliance while under the Strategy, many systems, including City of Conway Springs, City of Pretty Prairie, and Jewell County RWD #1 remain out of compliance after seven years. In instances where compliance has been achieved, more detailed documentation is necessary to support the time necessary to reach compliance.

Under 40 CFR 141.62, nitrate is permitted in systems at or below a level of 10 mg/L. The EPA has taken the position that levels above 10 mg/L are considered a significant health risk. Section 2.2.3 of the EPA's "Variance Technologies Findings for Contaminants Regulated Before 1996" document (EPA 815-R-98-003) dated September 1998, describes a statutory screen (Section 1412(b)(15)(B) of the SDWA) associated with adequate levels protective of public health, and the derivation of URTH values for regulated contaminants that passed the first two screens (Sections 1415(e)(6)(A) and (B)). Based on this screening, several contaminants, including nitrite and nitrate plus nitrite were removed from consideration for a variance technology since the derived URTH values were equal to or very close to the MCL. Both nitrite and nitrate plus nitrite have an MCLG based on acute toxicity. Thus any exceedance of the MCL may be considered a significant health risk. According to the Strategy, corrective action is not required until nitrate levels reach 20 mg/L.

IV. RECOMMENDATIONS

The purpose of the Nitrate Strategy was to provide the PWS time to come into compliance. The results of the Nitrate Strategy evaluation indicate that the Strategy has not been effective in returning systems to compliance. The Strategy is inconsistent with federal regulations, and therefore, may compromise the intent of the regulations to achieve compliance. Most PWSs did not meet the terms of the Strategy and long-standing nitrate levels have continued. The EPA would like to ensure that these PWSs return to compliance in a timely manner.

Systems currently under the Nitrate Strategy should be addressed using conventional enforcement methods. The KDHE should continue to pursue enforcement against systems which

continually detect nitrate at levels that exceed the MCL. Sending administrative compliance orders or consent decrees with compliance schedules guides systems into compliance while advocating timeliness to address the issue. The EPA recommends improving communication regarding the seriousness of nitrate violations by correcting deficiencies in the public notice and Consumer Confidence Report.

Recognizing that voiding the Nitrate Strategy may pose a significant workload burden on the state, the EPA would like to provide the KDHE with the opportunity to create a plan and schedule describing how the KDHE will address the systems currently under the Nitrate Strategy, to be submitted per the EPA review and approval.

**The KDHE Nitrate Strategy Review
File Review
20-21 April 2005**

PWS ID Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2013701	Almena	461	11.00, April-June 2003 12.23, April-June 2002 12.04, April-June 2001 13.75, Jan.-March 2001 11.44, Oct.-Dec. 2000 10.68, Oct.-Dec. 1999 11.70, July-Sept. 1998 .0575 April-June 1998 .0519 Jan.-March 1998 .0667, Oct.-Dec. 1997 10.73, July-Sept. 1997 11.38, Jan.-March 1995	Previously under Nitrate Strategy Returned to compliance in 2004
KS2019116	Argonia	524	11.00, Jan.-March 2005 11.00, Oct.-Dec. 2004 11.00, April-June 2004 12.00, Jan.-March 2004 Monit., Oct.-Dec. 2003 11.00, July-Sept. 2003 11.00, April-June 2003 10.90, Jan.-March 2003	Currently under Nitrate Strategy
KS2015511	Arlington	452	11.00, Jan.-March 2005 13.0, April-June 2004 13.6, Jan.-March 2004 11.00, Oct.-Dec. 2003 14.00, July-Sept. 2003 10.91, April-June 2003 11.48, Jan.-March 2003 12.14, July-Sept. 2002	Currently under Nitrate Strategy
KS2008906 FILE NOT REVIEWED BY EPA	Burr Oak	241	Monit. April-June 2002 14.30, Jan.-March 2002 12.97, Oct-Dec. 2001 14.09, Jan.-March 2001 10.90, Oct-Dec. 2000 14.58, April-June 2000 .0981, July-Sept. 1998 .0724, April-June 1998 .0611, Oct.-Dec. 1996 .0785, Jan.-March 1995	Previously under Nitrate Strategy Connected with Jewell Co RWD #1, returned to compliance in 2004

PWS ID Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2115513	Colwich Elementary (St. Joseph's)	100	26.0 11.0	Non-Transient Closed?
KS2019118	Conway Springs	1308	11.0, Oct.-Dec. 2004 10.7, July-Sept. 2004 11.0, April-June 2004 11.0, Jan.-March 2004 10.75, Oct.-Dec. 2003 11.04, July-Sept. 2003 10.70, April-June 2003 10.59, Jan.-March 2003 10.61, Oct.-Dec. 2002 10.74, July-Sept. 2002 10.93, Oct.-Dec. 2001 10.93, Oct.-Dec. 2000 11.43, July-Sept. 2000 10.72, April-June 1998 10.54, July-Sept. 1996 11.16, Jan.-March 1995	Currently under Nitrate Strategy
KS2115514	Fairfield High School	240	14.00, Oct.-Dec. 2004 13.00, Aug.-Sept. 2004 16.00, April-June 2004 14.60, Jan.-March 2004	Non-Transient Violations not in SDWIS
KS2018301	Gaylord, City of	138	12.00, Jan.-March 2004 Monit., Oct.-Dec. 2003 Monit., July-Sept. 2003 13.50, April-June 2003 12.38, July-Sept. 2001 13.10, April-June 2001 13.15, July-Sept. 1998 24.94, April-June 1998 27.48, Jan.-March 1998 10.86, Oct.-Dec. 1997 15.18, July-Sept. 1997 11.87, April-June 1997 13.32, Jan.-March 1997	Previously under Nitrate Strategy Finalized blending of new wells in April 2004
KS2006302	Grainfield, City of	321	14.0, Oct.-Dec. 2004 12.0, Jan.-March 2004 10.6, Jan.-March 1995	Nitrate Violations have not constituted an action

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2002703 FILE NOT REVIEWED BY EPA	Green	145	12.00, July-Sept. 2003 13.92, Oct.-Dec. 2003 13.30, July-Sept. 2002 13.21, Jan.-March 2002 13.30, July-Sept. 2002 11.88, July-Sept. 2001 11.67, April-June 2001 12.24, Jan.-March 2001 12.26, July-Sept. 2000 12.03, Jan.-March 2000 10.57, Oct-Dec. 1999 12.58, July-Sept. 1999 13.59, April-June 1999 13.10, Jan.-March 1999 11.79, Oct.-Dec. 1998 12.81, July-Sept. 1998 13.29, Jan.-March 1998 12.40, Oct-Dec. 1997 12.67, July-Sept. 1997 11.86, Oct-Dec. 1996 11.67, April-June 1996 10.94, Jan.-March 1996 12.30, Oct-Dec. 1995 13.54, April-June 1995 10.65, Jan.-March 1995	Previously under Nitrate Strategy Returned to compliance in 2004
KS2020106	Greenleaf	349	11.0, April-June 2004 10.6, Jan.-March 2004 12.00, July-Sept. 2003 12.00, Jan.-March 2003 11.00, Oct-Dec. 2002 11.00, July-Sept. 2002 11.57, Oct.-Dec. 2001 10.95, July-Sept. 2001 11.08, April-June 2001	Currently under Nitrate Strategy
KS2007708	Harper Co. RWD #4	320	11.00, Jan.-March 2005 11.00, Oct.-Dec. 2004 11.00, April-June 2004 12.00, Jan.-March 2004 11.00, July-Sept. 2003 11.00, April-June 2003 10.90, Jan.-March 2003	Currently under Nitrate Strategy

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2001305	Hiawatha, City of	3366	12.00, April-June 2003 10.64, Jan.-March 2003 12.22, July-Sept. 2002 11.08, April-June 2002 12.12, Jan.-March 2002 11.54, April-June 2001 13.17, Oct.-Dec. 2000 11.28, April-June 2000 11.30, July-Sept. 2000 10.87, Jan.-March 2000 10.68, Oct.-Dec. 1999 10.88, July-Sept. 1999 10.88, April-June 1999 11.01, Jan.-March 1999 11.39, July-Sept. 1998 12.19, April-June 1998 10.95, Oct.-Dec. 1997 10.71, July-Sept. 1997 10.67, Jan.-March 1997	Previously under Nitrate Strategy Installed new well to come into compliance in order to not be eligible for the Surface Water Treatment Rule in 2004
KS2006902 FILE NOT REVIEWED BY EPA	Ingalls	331	11.00, April-June 2004 12.00, Jan.-March 2004 12.00, Oct.-Dec. 2003 11.00, July-Sept. 2003 11.00, April-June 2003 12.67, July-Sept. 2000 11.17, April-June 2000 11.83, Jan.-March 2000 11.70, Oct.-Dec. 1999	Currently under Nitrate Strategy

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2008721	Jefferson Co RWD #15	228	13.0, Oct.-Dec. 2004 13.0, July-Sept. 2004 13.0, April-June 2004 14.1, Jan.-March 2004 15, Oct.-Dec. 2003 14, July-Sept. 2003 14, April-June 2003 15.38, Jan.-March 2003 13.76, Oct.-Dec. 2002 14.13, July-Sept. 2002 13.83, April-June 2002 Monit Jan.-March 2002 12.66, Oct.-Dec. 2001 12.54, July-Sept. 2001 13.41, April-June 2001 11.82, Jan.-March 2001 13.88, Oct.-Dec. 2000 12.32, July-Sept. 2000 12.76, April-June 2000 12.20, Jan.-March 2000 12.24, Oct.-Dec. 1999 12.69, July-Sept. 1999 13.38, April-June 1999 11.05, Jan.-March 1999 10.77, April-June 1996	Previously under Administrative Order Previously under Nitrate Strategy, KDHE escalated due to non-compliance

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2008907	Jewell Co RWD #1	959	14.00, July-Sept. 2004 11.00, April-June 2004 12.00, Jan.-March 2004 13.00, Oct-Dec. 2003 13.00, July-Sept. 2003 15.00, April-June 2003 12.00, Jan.-March 2003 14.25, Oct-Dec. 2002 13.73, July-Sept. 2002 13.18, April-June 2002 15.25, Jan.-March 2002 14.59, Oct-Dec. 2001 12.32, July-Sept. 2001 15.25, April-June 2001 12.44, Jan.-March 2001 15.27, Oct-Dec. 2000 12.93, July-Sept. 2000 14.48, April-June 2000 15.81, Jan.-March 2000 15.25, Oct-Dec. 1999 12.40, July-Sept. 1999 12.70, April-June 1999 14.23, Jan.-March 1999 14.39, July-Sept. 1998 13.49, April-June 1998 13.62, Jan.-March 1998 13.60, Oct-Dec. 1997 13.05, July-Sept. 1997 10.92, April-June 1997 13.30, Jan.-March 1997 12.94, Oct-Dec. 1996 13.85, July-Sept. 1996 13.19, April-June 1996 12.44, Jan.-March 1996 13.47, Oct-Dec. 1995	Currently under Nitrate Strategy
KS2119308	KDOT EB	25	12.0, April-June 2004 12.4, Jan.-March 2004	Non-Transient Violations not in SDWIS

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2014702	Kirwin, City of	226	11.00, April-June 2004 12.22, Jan.-March 2003 12.06, Oct-Dec. 2002 13.90, July-Sept. 2002 14.13, April-June 2002 16.21, Jan.-March 2002 19.67, Oct-Dec. 2001 19.29, April-June 2001 27.86, April-June 1998 22.94, Jan.-March 1998 15.46, Oct-Dec. 1997 11.34, July-Sept. 1997 12.39, April-June 1997 14.07, July-Sept. 1996 21.47, April-June 1996 12.46, Jan.-March 1996 16.93, Oct-Dec. 1995 16.97, April-June 1995 12.02, Jan.-March 1995	Currently under Nitrate Strategy
KS2014703	Long Island	152	11.00, April-June 2003 18.12, Jan.-March 2003 18.77, Oct-Dec. 2002 15.30, July-Sept. 2002 24.04, April-June 2002 23.34, Jan.-March 2002 26.60, Oct-Dec. 2001 17.60, July-Sept. 2001 17.62, April-June 2001 16.54, Jan.-March 2001 21.99, Oct-Dec. 2000 27.02, July-Sept. 2000 22.42, April-June 2000 19.45, Jan.-March 2000 19.40, Oct-Dec. 1999 17.56, July-Sept. 1999 17.11, April-June 1999 17.77, Jan.-March 1999 18.68, Oct-Dec. 1998 19.76, July-Sept. 1998 17.99, April-June 1998 18.82, Jan.-March 1998 17.51, Oct-Dec. 1997 17.33, July-Sept. 1997 17.11, Jan.-March 1997	Previously Under Nitrate Strategy

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2016702	Lucas	422	13.00, 2004 19.04, July-Sept. 1998 19.69, April-June 1998 19.54, Jan.-March 1998 19.63, Oct.-Dec. 1997 18.96, July-Sept. 1997 19.14, April-June 1997 20.26, Jan.-March 1997 20.28, Oct.-Dec. 1996 20.67, July-Sept. 1996 20.27, April-June 1996 19.33, Jan.-March 1996 17.08, Oct.-Dec. 1995 18.59, July-Sept. 1995 18.49, April-June 1995 19.76, Jan.-March 1995 23.22, Oct.-Dec. 1994	Previously referred to the Attorney General's Office. Ion exchange treatment was installed in 1998.
KS2117304	Maize Intermediate School	870	11.0, Jan.-March 2003	Non-Transient Violations not in SDWIS
KS2009505	Norwich	543	15.00, Oct-Dec. 2004 14.00, Jan.-March 2004 14.00, Oct.-Dec. 2003 Monit, Jan.-Dec. 2000 Monit., Jan.-Dec. 1999 13.10, Oct.-Dec. 1998 12.03, July-Sept. 1998 15.55, Jan.-March 1998 12.43, Oct.-Dec. 1997 12.14, April-June 1997 11.91, Oct.-Dec. 1996	Currently under Nitrate Strategy
KS2011903	Plains	1171	11.00, April-June 2004 11.00, Jan.-March 2004 11.00, Oct.-Dec. 2003 12.00, July-Sept. 2003	Currently under Nitrate Strategy

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2015501	Pretty Prairie	610	11.00, Oct-Dec. 2004 12.00, July-Sept. 2004 12.20, April-June 2004 11.50, Oct-Dec. 2003 10.90, July-Sept. 2003 11.10, April-June 2003 11.70, April-June 2002 12.20, Jan.-March 2002 10.60, July-Sept. 2001 11.50, Jan.-March 2001 10.90, April-June 1999 10.60, Jan.-March 1999 10.74, Jan.-March 1997 10.52, April-June 1996 13.65, Jan.-March 1995	Currently Under Nitrate Strategy
KS2004105	Solomon	1063	14.00, 2004	Nitrate Violations have not constituted an action
KS2019101	Sumner Co RWD #5	850	11.00, Jan.-March 2004 10.75, Oct.-Dec. 2003 11.04, July-Sept. 2003 10.70, April-June 2003 10.59, Jan.-March 2003 10.61, Oct.-Dec. 2002 10.74, July-Sept. 2002 10.93, Oct.-Dec. 2001 10.93, Oct.-Dec. 2000 11.43, July-Sept. 2000 10.72, Jan.-March 1998 10.54, July-Sept. 1996 11.16, Jan.-March 1995	Currently under Nitrate Strategy

Permit Number	Name of System	Pop. Served	Nitrate Exceedance History	Reason For Evaluating
KS2105525	Tyson Fresh Meats, Inc	2900	15, Dec. 2004 13, Nov. 2004 14, Oct. 2004 13, Sept. 2004 14, July 2004 14, June 2004 15, May 2004 12, April 2004 20, March 2004 19, March 2004 19.4, Feb. 2004 22.1, Jan. 2004 21.0, Jan.-March 2003 27.1, July-Sept. 2003 23.16, July-Sept. 2002	Currently under Administrative Order Exceeded 20 mg/L, N-Waiver
KS2017313	Viola	215	11.00, Jan.-March 2004 10.75, Oct.-Dec. 2003 11.04, July-Sept. 2003 10.70, April-June 2003 10.59, Jan.-March 2003 10.61, Oct.-Dec. 2002 10.74, July-Sept. 2002 10.93, Oct.-Dec. 2001 10.93, Oct.-Dec. 2000 11.43, July-Sept. 2000 10.72, Jan.-March 1998 10.54, July-Sept. 1996 11.16, Jan.-March 1995	Currently under Nitrate Strategy
KS2012703 FILE NOT REVIEWED BY EPA	White City	514	11.00, July-Sept. 2003 11.00, Jan.-March 2003 11.26, July-Sept. 2002 10.77, April-June 2002 11.56, Jan.-March 1998 10.67, July-Sept. 1996	Currently under Nitrate Strategy

SUMMARY OF FINDINGS FOR COMMUNITY WATER SYSTEMS

Almena, City of: This municipality serves a population of 461 and surpassed the nitrate MCL in twelve quarters, between 1995 until 2003. Exceedance levels ranged from 10.73 mg/L to 13.75 mg/L. The system was placed under the Strategy through an Administrative Order in September 2001. In 1997 and 1998, nitrate was reported as nitrite and two consecutive MCL violations occurred. However, the system was not placed under the Strategy until two consecutive nitrate violations occurred in the quarters of January 2001 and April 2001. Proof of public notice was found in the file for some violations, but was missing for violations occurring in October 2000 and January 2001. Nitrate concentrations were incorrectly reported in the Annual Consumer Confidence Report (CCR) of 2000 as 1.7 mg/L and in 2001 as 3.01 mg/. The system was returned to compliance in November 2004, as the system had gone four consecutive quarters without exceeding the nitrate MCL. While the reason justifying a decrease in nitrate concentrations is uncertain, public notifications dated May 20, 2002 and July 2003 indicated that the City was considering blending at that time. Other correspondence in the file dated September 3, 2004 indicated that the City was considering installation of four new wells.

Argonia, City of: This municipality serves a population of 524 and surpassed the nitrate MCL in eight quarters, between January 2003 through March 2005. Exceedance levels ranged from 10.90 mg/L to 12.00 mg/L nitrate. The system was placed under an order in September 2003, in accordance with the terms and conditions of the Strategy. Proof of public notice was available for all nitrate violations, with the exception of February 2005. Several notices lack reference to provision of an alternative water supply. According to the file, the system has not examined treatment or new source options. However, the KDHE noted through correspondence to the EPA that this system is being assessed jointly with Conway Springs in order to establish a viable source of drinking water.

Arlington, City of: This municipality serves a population of 452 and surpassed the nitrate MCL in seven quarters, with an additional monitoring violation, between July 2003 through March 2005. The system was placed on quarterly sampling after it exceeded the nitrate MCL in April 2002. Exceedance levels ranged from 10.91 mg/L to 14.00 mg/L. The system was placed under an order in May 2003, in accordance with the terms and conditions of the Strategy. Proof of public notice was submitted for all violations, with the exception of February 2004. Correspondence in the file dated September 15, 2003 indicates that the system was granted a \$250,000 loan. The City requested a preliminary engineering report in September 2004 and is working towards achieving compliance in what appears to be a timely manner.

Conway Springs, City of: This municipality serves a population of 1308 and exceeded the nitrate MCL in sixteen quarters between January 1995 until December 2004, with additional nitrate violations occurring prior to 1995. Exceedance levels ranged from 10.54 mg/L to 11.43 mg/L. The City also provides water to the City of Viola and Sumner County RWD #5. The EPA placed the system under an order in December 1994. Correspondence in the file dated June 26, 1997 indicates that the City proposed to install a de-nitrification plant. However, that course of action was not sought, as the system was placed under an order by the KDHE in December

1997, in accordance with the terms and conditions of the Strategy. The system was issued a boil water advisory for coliform violations in January 2005, which has the potential to increase the concentration of nitrates. Public notification has occurred, though never within the 24 hour timeframe. Every public notification submitted for nitrate was posted within one week at the earliest. According to 40 CFR 141.202 (b)(1), public notification must be conducted "as soon as practical but no later than 24 hours after the system learns of the violation." Public notification forms sent to the system by the KDHE state that "public notice is to be performed within 24 hours or as soon as practical." The 24 hour requirement should be presented more clearly to the system. The mandatory language for nitrate violations was not included in the CCR until 2002. The file contains no information documenting that the City is seeking alternative solutions to decrease nitrate levels, nor discusses wellhead protection and funding. It appears as though Conway Springs has not made any attempt to reduce their levels of nitrate. A spreadsheet which the KDHE uses to track the status of systems under the Nitrate Strategy states that an engineer is currently evaluating source or treatment options. Since reducing nitrate levels is not a requirement under the Strategy, it appears that Conway Springs has not put forth a timely effort to do so. Correspondence in the file indicates that the KDHE attended a meeting held by the City to discuss application of the Nitrate Strategy on February 28, 2005. Since the Order expired in December 2004, the City inquired about a "do nothing" option regarding their nitrate exceedances. The KDHE informed the City that the water needed to either be treated, or a new source sought. The City is considering a project that would provide quality drinking water jointly to Conway Springs, Norwich and Argonia. The KDHE permitted the City additional time to explore this option at the meeting. The KDHE has not renewed the Strategy, as they are awaiting comments from the EPA.

Gaylord, City of: This municipality serves a population of 138 and exceeded the nitrate MCL in eleven quarters between January 1997 until March 2004, with additional nitrate violations occurring prior to 1997. The City also failed to monitor for two quarters in 2003. Exceedance levels ranged from 12.000 mg/L to 27.48 mg/L. The system was placed under an order in December 1997, in accordance with the terms and conditions of the Strategy. An alternative source of water was provided, and advertised through the public notice. The City exceeded 20 mg/L in two consecutive quarters which began in January and April 1998. There is no documentation in the file which indicates that the City needs to seek further action due to the increased nitrate concentrations. The file contains no information documenting that the City is seeking alternative solutions to decrease nitrate levels, nor discusses wellhead protection and funding until August 2001. In August 2001, the City opted to blend two wells. Blending took effect in April 2004, several months prior to when the Order was to expire. Since that time, levels of nitrate have been below the MCL. The reason for the City's delay in seeking resolution is uncertain. From the information present in the files, it appears as though the seven year time frame allocated through the Strategy enabled the City to delay response. Additionally, repeat samples were taken at intervals greater than the regulations allow. Under 40 CFR 141.23, the system is required to take a confirmation sample within 24 hours from when an exceedance of the MCL is detected. When samples are not taken within this frequency, sampling may not be representative of nitrate levels. For example, files indicate that a sample was taken on February 18, 1998, detecting a concentration of 47.80 mg/L. A repeat sample was taken one month later, on March 17, 1998, detecting a concentration of 7.16 mg/L. When averaged together, the result was reported as 22.94 mg/L. A sample taken closer to the date in which nitrate was detected

could have led to an increase in the actual concentration of nitrate reported to SDWIS. Additionally, the system did not submit public notification in a timely manner, and failed to submit public notification for violations occurring in July 2001, October 2001 and January 2004.

Greenleaf, City of: This municipality serves a population of 349 and exceeded the nitrate MCL in nine quarters between April 2001 until June 2004. Exceedance levels ranged from 10.6 mg/L to 12.00 mg/L. The system was placed under an order in February 2002, after three consecutive quarters of nitrate violations, in accordance with the terms and conditions of the Strategy. According to 40CFR141.202 (b)(1), public notification must be conducted “as soon as practical but no later than 24 hours after the system learns of the violation.” Public notification forms sent to the system by the KDHE state that “public notice is to be performed within 24 hours or as soon as practical.” The 24 hour requirement should be presented more clearly to the system. Public notice was conducted 1-2 weeks after the violation occurred. Nitrate MCL exceedances are referenced in correspondence dated February 25, 2002, as occurring on April 26, 1999 and June 7, 2000, but do not appear in SDWIS. A feasibility study was conducted on April 15, 2003 to assess the potential for the City to connect with Washington RWD. The outcome of this study was not documented in the files.

Harper County RWD #4: This rural water district serves a population of 320 and exceeded the nitrate MCL in seven quarters between January 2003 through March 2005, with exceedance values ranging from 10.90 mg/L to 12.00 mg/L. The system purchases water from the City of Argonia, a municipality which is also under the Nitrate Strategy. The City was placed under the Strategy in November 2003, two months after Arlington. Customers who need and alternative source of water are referred to the City of Argonia.

Hiawatha, City of: This municipality serves a population of 3306 and exceeded the nitrate MCL in nineteen quarters between January 1997 until June 2003, with additional nitrate violations occurring prior to 1997. Exceedance levels ranged from 10.64 mg/L to 13.17 mg/L. The system was placed under an order in April 1998, in accordance with the terms and conditions of the Strategy. Proof of public notice was submitted, though not in a timely manner. The file contains no information documenting that the City sought alternative solutions with the intentions of reducing nitrate levels, nor was wellhead protection or funding discussed. In April 2003, the system was notified that it was a system under the influence of surface water, and therefore, was required to comply with the Surface Water Treatment Rule. Compliance with this rule would require additional monitoring and added expense. Therefore, the City opted to abandon well #3 and install a new well. Well #3 was also the source of high nitrates. Once the well was taken off-line, nitrates dropped below the MCL. Funding appears to have been available for action to have been taken in a more timely manner in response to non-compliance with the nitrate MCL. Improved communication with the system on the need to comply with the MCL for nitrate could have led to a more timely response.

Jefferson Co RWD #15: This rural water department serves a population of 228 and exceeded the nitrate MCL in twenty-four quarters between April 1996 until December 2004, with a monitoring violation occurring in January-March 2002 and additional nitrate violations occurring prior to 1996. Exceedance levels ranged from 10.77 mg/L to 15.38 mg/L. The system was placed under an order in 1997, in accordance with the terms and conditions of the Strategy,

which replaced an order administered in 1994. An administrative order with penalty was administered in May 2002 due to non-compliance with the Nitrate Strategy, failure to conduct public notification and non-compliance with the lead and copper rule and total coliform rule. The Order required the City to submit a written report stating why they had not complied with the Nitrate Strategy, conduct a feasibility study, submit public notification, and continue monitoring. The penalty totaled \$1,500 and was paid in full in 2003. The EPA terminated the order in late May 2002 for failure to comply with the CCR. Correspondence with the RWD in August 2002 indicated that the district had the funds necessary to correct the system. The system decided in October 2004 to connect with Jefferson Co RWD #1 and began laying the pipe in March 2005. The anticipated date of completion is not documented in the file. (Note: Since the review, the KDHE reported that the connection was complete in June 2005).

Jewell Co RWD: This municipality serves a population of 959 and exceeded the nitrate MCL in thirty-five quarters between October 1995 until September 2004, with additional nitrate violations occurring prior to 1995. Exceedance levels ranged from 11.00 mg/L to 15.81 mg/L. The system was placed under an order in October 1997 due to the formation of the Nitrate Strategy several months prior. During this time, public notice was provided by the system. The public notice was delivered to health care facilities, as specified under the Strategy, though the notification did not communicate the steps the system was taking to come into compliance and when the system was expected to return to compliance. Under the terms of the Strategy, systems detecting concentrations that range from 10-15 mg/L are to examine options for a new source or treatment, wellhead and funding. These options were examined, though not until 2001-2002. Wellhead protection began in 2001. Funding for a new supply was sought in 2002. The system was out of compliance for four years before the RWD responded to the terms outlined in the Order. The system exceeded 15 mg/L for two consecutive quarters beginning in October 1999 and January 2000. Under the terms of the Strategy, a new treatment was to be proposed at that time, based on a feasibility study prepared by an engineer. While the feasibility study was not in the file, the RWD made a decision to install new wells in June 2003. Funding was requested and granted for additional wells in November 2004. These actions were not taken in a timely manner. The City of Lebanon was once connected to Jewell Co RWD, and sought action against the RWD to release them of their contract to purchase water from the RWD on the basis that "the quality of water has been getting worse, not better." The City of Lebanon disconnected from Jewell in July 2001 and sought a sustainable source of water. The seven-year term outlined by the Strategy to come into compliance has expired for Jewell Co RWD. The KDHE has not renewed the Strategy, as they are awaiting comments from the EPA.

Long Island, City of: This municipality serves a population of 152 and exceeded the nitrate MCL in twenty-five quarters between January 1997 until June 2003, with additional nitrate violations occurring prior to 1997. Exceedance levels ranged from 15.30 mg/L to 27.02 mg/L. The system was placed under an order in October 1998, though qualified for the Strategy in September 1997. The order outlined terms and conditions of the Strategy. Proof of public notice was submitted for most violations, with the exception of November 1999, July 2000, October 2000 and January 2001, though not always posted with the time frames required in the Public Notification Rule. In December 1999, the KDHE sent a letter to the City stating that a feasibility study was required under the Consent Order, and had not been received. The City drilled sixteen holes to test for a new well in January 2000, none of which met the MCL for nitrate. None of the

In July 2000, the KDHE sent a letter to the City notifying them of their failure to monitor. On July 25, 2000, the City drilled a new well. High nitrate levels persisted. The City surpassed 20 mg/L in April 2000. The KDHE notified the City of the violation, though the City was not reminded that further action was required in accordance with the Order. The City requested in July 2001 to begin installation on a new well the following Spring. The KDHE approved the request. The City applied for a loan in January 2001. The City began construction of the new well in August 2002, and was permitted in the fall of 2003. The City sampled below the MCL for four consecutive quarters, from July 2003 until June 2004. The Consent Order was terminated in November 2004, and the City received permission to switch to annual monitoring in January 2005. The seven year time frame allocated through the Strategy places a deadline of 2005 for the City to come into compliance. The City was able to meet this deadline, even with the additional year it took to submit a feasibility study and the time pressure that was exerted to find a new well.

Kirwin, City of: This municipality serves a population of 226 and exceeded the nitrate MCL in nineteen quarters between January 1995 until June 2004, with additional nitrate violations occurring prior to 1995. Exceedance levels ranged from 11.00 mg/L to 27.86 mg/L. The City of Kirwin was not addressed by a Nitrate Strategy Consent Order. The City was placed under an order by the EPA in August 1995 which included a compliance schedule. A status of the City's compliance with the established milestones was requested in 1997, in which the City responded that the City was searching for a new well field. Bottled water was supplied beginning in August 2001 and the EPA terminated the order at that time. Additional nitrate violations followed in 2001 and 2002. A feasibility study to install new wells was conducted in June 2002. The KDHE approved the plans in August 2002 and the City completed construction of the wells in April 2003. Levels of nitrate which exceeded the MCL were detected in the new well in June 2004.

Norwich, City of: This municipality serves a population of 543 and exceeded the nitrate MCL in nine quarters between October 1996 until December 2004, with additional nitrate violations occurring prior to 1996. Exceedance levels ranged from 11.91 mg/L to 15.55 mg/L. The system was placed under an order which includes the terms of the Nitrate Strategy in May 1998, though qualified for the Strategy after incurring violations in two of three consecutive quarters, in quarters beginning with October 1996 and April 1997. Nitrate exceedances are not documented in SDWIS from 1999-2000, as monitoring for nitrate did not occur during this timeframe. The order was terminated in December 2001, when nitrates were below the MCL for four consecutive quarters from January 2001 until December 2001. One year and nine months after the order was terminated, nitrate levels exceeded the MCL and were initially detected at 14.00 mg/L. A new order was administered which included the terms of the strategy in June 2004. Because the Strategy provides for a seven year timeframe from the date of issue, the City now has until 2011 to come into compliance under the terms of the Strategy. Files provide little documentation to indicate that the City has sought a new water source, participated in wellhead protection, or examined the potential for funding. The Strategy requires that these criteria be evaluated when nitrate was first detected above the MCL, or when the system was first placed under an order in May 1997. Nitrate was first detected above 15.00 mg/L in 1998. Because the City failed to monitor, there is no indication of whether nitrate persisted at these high levels in proceeding quarters. While the terms of the order were unfulfilled, the KDHE chose not to seek further action.

Plains, City of: This municipality serves a population of 1171 and exceeded the nitrate MCL in four quarters between July 2003 and June 2004. Exceedance levels ranged from 11.00 mg/L to 12.00 mg/L. The system was placed under an order in March 2004, in accordance with the terms and conditions of the Strategy. A well was taken off-line in June 2004, lowering nitrate levels to below the MCL. A new well is in the process of being built, which will return the system to compliance.

Pretty Prairie, City of: This municipality serves a population of 610 and exceeded the nitrate MCL in fifteen quarters between January 1995 and December 2004. Exceedance levels ranged from 10.52 mg/L to 13.65 mg/L. The EPA administered an Order in January 1994. In response to the order, the City drilled new wells. Once in operation, the new wells exceeded the MCL for nitrate. While not yet formulated, the KDHE placed the system under an order similar to the Nitrate Strategy in October 1996 and the EPA dismissed their previous order. The terms of the Order, which later formed the Nitrate Strategy, were intended to promote wellhead protection. The wellhead protection plan was approved in October 2000. The system continued to exceed the nitrate MCL. In May 2003, Kansas Rural Water proposed to test the irrigation wells for nitrate to determine whether the wells would be suitable for consumption in the future, if necessary. The Order expired in October 2003, and remains out of compliance. The KDHE has not renewed the Strategy, as they are awaiting comments from the EPA.

Robinson, City of: This municipality serves a population of 208 and exceeded the nitrate MCL in eight quarters between January 1995 until September 2003. The nitrate MCL was exceeded in 1995, with concentrations occurring at 11.0 mg/L from January-June 1995. The nitrate MCL was not exceeded again until April 1999, with a detection of 12.06 mg/L. Since that time, six exceedances have occurred, ranging in concentration from 11.0 mg/L to 12.34 mg/L. The KDHE placed the City under an order in January 2001, which required the City to take from well #2 only, and place well #7 and #8 on emergency use. The City entered into a consent agreement with the KDHE in May 2001 re-opening wells #7 and #8 for blending. The KDHE required weekly monitoring for three months to ensure that blending was reducing nitrate concentrations to below the MCL. The City's monitoring frequency was reduced to monthly in October 2001. Another consent agreement was signed in January 2003 taking well #7 off-line. The City had an additional nitrate violation in the quarter beginning with July 2003, barely exceeding the MCL. The City has not exceeded the MCL for nitrate since that time.

Sumner Co RWD #5: This rural water district serves a population of 850 and exceeded the nitrate MCL in sixteen quarters between January 1995 until December 2004, with additional nitrate violations occurring prior to 1995. Exceedance levels ranged from 10.54 mg/L to 11.43 mg/L. The RWD is connected to Conway Springs, and serves water to Viola, and therefore, has the same pattern of nitrate exceedances. Though not in the file, SDWIS indicates that the system was placed under an order by the KDHE in February 2003. The terms of the Strategy require that an order be issued after two consecutive exceedances. Nitrate MCL violations occurred consecutively for the quarters beginning with July and October in 2000. However, the KDHE did not send an order since the system's water originates from Conway Springs, which was already under an order. Conversations with the KDHE indicated that the KDHE had not responded to the violations due to the EPA involvement. Public notification has occurred,

though not within the 24 hour timeframe, nor indicating how bottled water can be obtained. Public notification was not provided for the quarter April-June 2004. The mandatory language for nitrate violations was originally not included in the 2002 CCR, though the KDHE sent notice to the system requiring that the CCR be re-issued to include this information. The RWD does not plan to examine alternative sources, as it is relying on the actions of Conway Springs.

Viola, City of: This municipality serves a population of 215 and exceeded the nitrate MCL in sixteen quarters between January 1995 until December 2004, with additional nitrate violations occurring prior to 1995. Exceedance levels ranged from 10.54 mg/L to 11.43 mg/L. The City is connected to Sumner Co RWD, which receives their water from Conway Springs, and therefore, has the same pattern of nitrate exceedances. The system was placed under an order by the KDHE in February 2003. The terms of the Strategy require that an order be issued after two consecutive exceedances. Nitrate MCL violations occurred consecutively for the quarters beginning with July and October in 2000. However, the KDHE did not send an order since the system's water originates from Conway Springs, which was already under an order. Conversations with the KDHE indicated that the KDHE had not responded to the violations due to the EPA involvement. Public notification has occurred, though not within the 24 hour timeframe. The City does not plan to examine alternative sources, as it is relying on the actions of Conway Springs.